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COMING!

As described in this week's issue, Chicago with her colorful "Century of Progress" exposition is marking her rise from insignificant Fort Dearborn to the nation's second city. But iron and steel also has experienced a century of progress, both in production and in technique, to be summarized next week.

This week is recorded the noteworthy gain registered in May in the production of coke pig iron. Next week comes the American Iron and Steel institute report on the steel ingot situation in May.

Report of annual convention of National Metal Trades association—next week.

Last minute details of American Foundrymen's association convention and exposition—next week.

Description of pickling tanks of concrete lined with asphalt-impregnated tile to resist sulphuric acid—soon.

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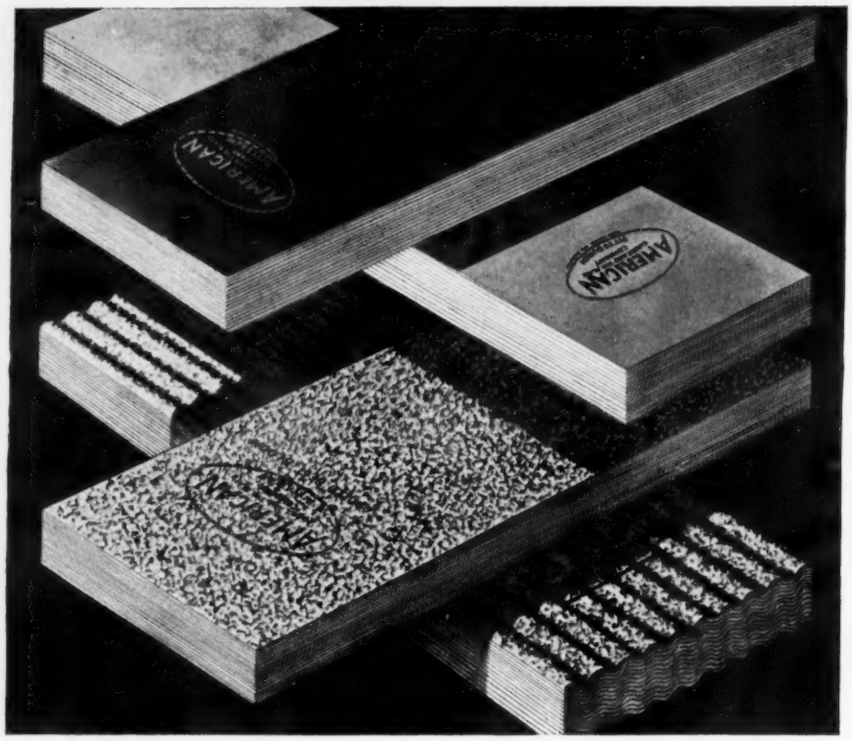

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Volume 92 Number 23

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

WHEN the President suggests indirectly to iron and steel that it spread employment to afford labor a 32-hour work week and increase wage rates to insure $15 in every weekly pay envelope he finds executives responsive. But when he opens the door to unionization, as executives are beginning to realize that the Wagner bill does, he touches their sensitive nerve. The most vigorous dissent thus far to the President's industrial recovery program results (p.21); President Lamont of the American Iron and Steel institute uses strong language when he tells the senate that the intent of the bill cannot be accomplished if the open-shop position of the industry is not protected.

Wage Advances Near; General Motors Leads

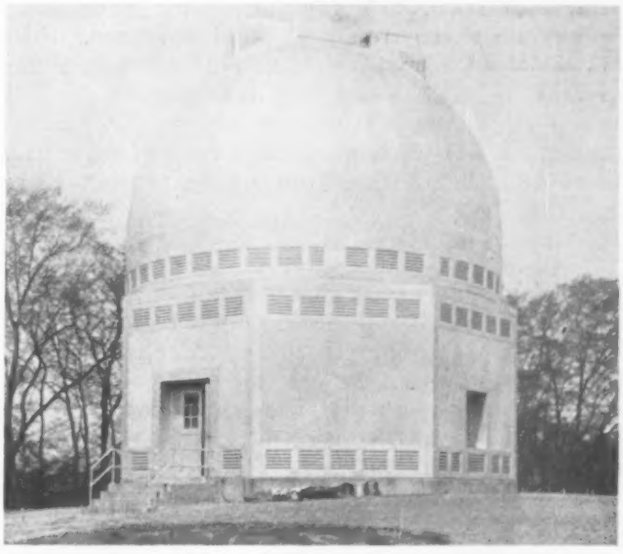
The institute, with other associations representing various departments of the industry, continues, however, to proceed along the other lines of the program. A code of practice is being drafted (p.17), and announcement of a 10 to 15 per cent wage increase as the first stage toward a $15 weekly minimum is in early prospect. . . . General Motors is setting the pace for the automotive industry with a 5 per cent advance in wages (p.23). . . . A discordant note is a reduction (p.16) in the base rates of higher-paid employes governed by the Amalgamated association scale. . . . Also against the current is the adjustment (p.23) of DeSoto and Chrysler automobile prices down $30 to $100.

Half of Steelmaking Capacity Now Engaged

Regarding an increase in finished steel prices as a certainty, consumers are moved to specify current contracts fully, accounting in part for a further gain in steelmaking operations to 47 per cent (p.19)—really more than 50 per cent when practical capacity is considered. . . . A brisk market situation is the result (p.51), with railroad buying an increasingly important factor. . . . Almost astounding is the showing of pig iron production for May (p. 20): Daily rate up 40.7 per cent to 29,249 tons; month's total up 283,119 tons to 906,725 tons; an increase of 13 in active stacks, making 23 resuming in the past two months. . . . Tin plate mills, at 85 to 90 per cent (p. 59), lead all domestic finishing departments, and it is more than coincidence that abroad tin plate also is an active product, some South Wales mills being booked (p. 67) through the remainder of this year.

Iron and Steel Go to the Fair

Iron and steel, the metalworking industry, and the larger consumers, including automobile manufacturers and the railroads, are generously represented at the Chicago Century of Progress exposition (p. 13). And in keeping with the spirit of the times, they have "gone modern," depicting through scenoramas and dioramas, as well as working exhibits and



The navy's largest eye has a steel lid, covering the 40-inch telescope at the naval observatory at Washington. No. 20 gage sheets form an inner and outer sheathing, permitting air to circulate and preventing heat waves from interfering with desired clear vision

mere presentations of their products, the immensity of the industry and its role in modern civilization. Fifty million persons are expected to be impressed with the story of steel before the exposition gates close.

Cold or Hot, Chrome-Nickel Steel "Takes It"

Bitter winds out of the Arctic will howl harmlessly around the 71-foot Peary memorial on Cape York in northern Greenland, the memorial of boulders being capped (p. 34) with a pyramid-shaped hood of 18-8 chrome-nickel steel ground and polished to withstand the rigors of the far North. . . . A contrast in temperature is a process (p. 44) for making castings with a chromium-nickel or chromium exterior with a plain carbon steel or gray iron interior, the veneer being applied to the mold and the core poured afterward. . . . A cast iron analyzing 14 per cent nickel, 6 per cent copper and 2 per cent chromium is finding (p. 44) wide use in many fields where heat or corrosion must be overcome.

The Times Spur the Engineering Mind

Sensitive to new requirements of users, manufacturers of riveting equipment, for one thing, have brought out (p. 39) light weight riveters suspended on balancers to facilitate easy handling, which are being used on as wide a range of fabricating operations as assembly of bed springs to riveting of lifeboat keels. . . . New designs in beer barrels emphasize (p. 33) the advantages of these metal containers from the standpoint of constant capacity, uniform weight, seamless construction, easy cleaning and sterilization. . . . Phosphorizing has been developed (p. 46) for imparting a chemical black finish to iron and steel surfaces, which is resistant to oxidation and protects the base metal. . . . An eastern mill improves physical properties and flatness of plates by passing them (p. 33) through a continuous furnace before sending them to the straightening rolls.

X-Ray Field Broadens as Cost Is Lowered

X-ray practice has been greatly refined, recent advances including (p. 29) an inexpensive sensitive paper to replace film, and design of new equipment for use in the industrial field. The latter is mounted on a trunnion and placed on a trailer or slung from a derrick for ship hull or vertical tower inspection. Complete cost figures have been worked out, particularly for welded structures. . . . A welding operation costing $100 saved (p. 44) a $2000 replacement job when a diesel engine crankshaft used by a logging company broke. . . . Welders at a Pennsylvania steelworks are kept busy, in their spare time, reclaiming (p. 46) such parts as open-hearth and heating furnace doors, buckstays and skewbacks.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Brighter Outlook for Machinery and Tools Industry

The machinery and tools industry during the past year has been at its lowest ebb in history considering the amount of its capital investment, the ordinary volume of its business and the number of those engaged in it. This means that when the up-turn takes place much of what would ordinarily have been done during these past 3½ years will be made up in addition to the usual amount of work. The outlook for the machinery and tools industry therefore is very good.

We have been told that this depression has been brought about by surpluses, but many peoples can very conveniently use this so-called surplus production. Over half of the national populations of the world have no hot and cold water systems, bath tubs, telephones, radios or any of the other common "necessities" such as are known in the United States.

The great machinery using countries—the United States, England, Germany, France, are the wealthiest. Standards of living in these countries are highest but within a day's journey from any spot in these same countries are prevailing the same low standards that existed hundreds of year sago. Our transportation facilities have so shortened distances that this is readily seen. Therefore, to promote the sale of machinery and its products necessarily means increasing our own as well as our buyers' standards and wealth.

The machinery and tools industry as a whole has devoted its time and energy primarily to producing equipment and products. The marketing of these products has been left mostly to the care of those outside the industry. When more thought and effort are given by those within this industry to marketing procedures, the developing of new markets and the research necessary to find out what products are required for the different markets, the machinery and tools industry will advance accordingly.

The importance of machinery and tools is scarcely realized by the public at large, yet without machinery the present population of the world which has more than tripled since 1800, could not be fed, clothed, or sheltered. Sufficient food crops could not be planted, harvested, transported and stored without machinery; cotton, wool, linen, silk, leather, could not be produced and fabricated in sufficient quantities to clothe us without machinery; it would be impossible to house the people if nails had to be made by hand, bricks made by hand, lumber or stone or steel fashioned and transported without machinery.

Since the advent of the new hard alloys such as the tantalum carbides, (vascoloy and ramet) and the tungsten carbides (carboloy, widia, firthite and carmet), a great many changes will have to be made in the machinery using cutting tools to enable the new materials to be used advantageously. This will in turn permit of all machinery and machinery products to be made at a much less production cost, thereby benefiting both those in this industry and their customers who are the general public.

I can say confidentially that with the wholehearted co-operation on the part of the members of this industry and the government to put a stop to the unfair tactics of the sweat-shop owner and the price-cutter demoralizer, together with the rational regulation of production, the industry will advance to greater heights than heretofore.

W. R. May, Retiring President,
Chicago American Machinery and Tools Institute

Nothing moves without steel! Large scenorama in the exhibit of the United States Steel Corp. at the Chicago Century of Progress exposition, portraying the contribution of steel to land transportation

Iron, Steel Record Progress at Chicago Fair

FORTY years ago, when the World's fair of 1893 was in progress at Chicago, a beam of light left the star Arcturus and speeded at a rate of 11,178,000 miles a minute toward the earth. During the past two decades man devised a means of capturing such a beam and of harnessing its energy.

On May 27 this 40-year old shaft reached the earth and, focused upon a photoelectric cell, actuated controls which lighted a magic city erected on Chicago's shores and signaled the opening of A Century of Progress exposition.

The village of Chicago was incorporated in 1833; today, through a tremendous and inspirational World's fair, she not only celebrates her one hundredth anniversary but also portrays how a succession of scientific discoveries and inventions have transformed the world in the last century and how further developments await the ensuing years.

Past Is Not Forgotten

While the unique method of opening A Century of Progress is typical of modern science, and the fair's structures and exhibits breathe of modernism and futurism, history and the beauties of the old world have not been neglected.

Through a comparison of the present with the past, the strides of science and industry are successfully depicted, and because of its all-inclusive nature Chicago's exposition effectively becomes a compact yet comprehensive and vivid encyclopedia of world progress.

So great is this undertaking that this brief description of it hardly can be termed even a synopsis. On the 424 acres of the fair grounds, extending 3½ miles along the lake front, are 62 buildings given over to free exhibits, with a total corridor length or walking distance of 82 miles. Exhibits number about 12,000; to spend 2 minutes viewing each one would require of the spectator 8 hours daily for 50 days.

More than 500 companies, associations, organizations, government units and others have sufficient displays to lead to official listings under names. Minor participation raises the total to approximately 1500. Added to these figures would be the many and varied types of amusement concessions and restaurants which bring the aggregate cost of buildings and exhibits to $37,572,011.

Art collections brought to Chicago for display have been insured for more than $90,000,000, while the Field museum, the Adler planetarium and the Shedd aquarium, permanent structures but integral parts of the fair, represent additional millions. Fair officials anticipate an attendance of 50,000,000.

In many respects this exposition is unique, characterizing the spirit of progress that it proclaims. A few years ago the ground on which the fair was built did not even exist.

Years of severe business depression failed to deter its successful culmination as originally conceived five years ago, and while its glory is Chicago's and the many who are participating in it, none of its financing was supplied by the treasuries of the city, state or nation. Private subscriptions and exhibition space sales have paid the way.

New notes have been struck in architecture, decoration and illumination that present an effect both startling and harmonious. The planning and construction of the fair itself was a mammoth undertaking, the carrying-out of which would have been impossible without the development in building methods and materials and in other industries.

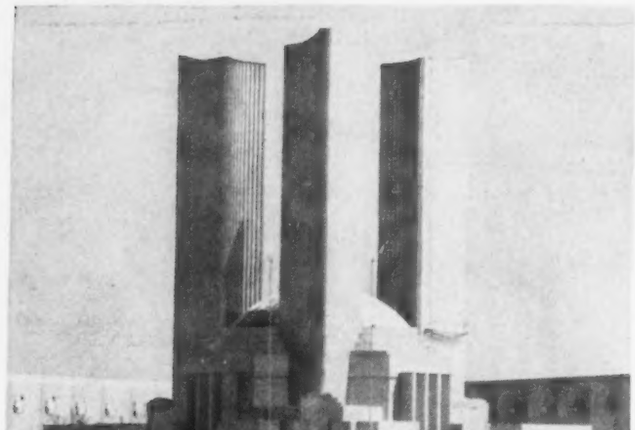
While previews of the first major structures erected for the exposition aroused considerable comment, some adverse, because of their radical departure from the commoner and more conservative style of architecture, subsequent decorating and landscaping have done much to enhance and emphasize their real beauty. Painting of the buildings has produced a result one step beyond the usual conception of a riot of color.

Marvel of Color and Light

A skillful combination of 25 colors, some brilliant, some soft—blues, reds, greens, bronzes, silver, golds, black and white—blends effectively with trees, grass and shrubbery in the foreground and Lake Michigan's broad expanse in the distance. Liberal use of miles of neon tubes and hundreds of thousands of

Read STEEL at Exposition

CURRENT copies of STEEL *and other publications of the Penton Publishing Co., Cleveland, are on file at all times in the Time-Fortune building. The publishers of* STEEL *invite its readers who are attending the Century of Progress exposition to visit this exhibit, rest and keep abreast of developments in the markets and technique of their industry as readily as they do at home.*



Triple, fluted spires representing the executive, judicial and legislative branches of the government — rise 150 feet above the 75-foot dome of the federal building. In the background is the Hall of States

incandescent bulbs produces a colorful and majestic sight at night that is in sharp contrast to the Columbian exposition of 1893, when the electric light bulb was a novelty.

Among the larger exhibit buildings housing most of the displays are: Hall of Science; General Exhibits group, including five buildings; Home Planning hall; Travel and Transport building, including the transportation dome; Dairy building; Food and Agriculturai building; United States government building; States building; Hall of Social Science; Radio and Communications building; and Electrical building.

Private companies have erected the Home and Industrial Arts group, involving 12 buildings; also the Firestone, Johns-Manville, General Motors, Chrysler, International Harvester, Sears-Roebuck, Whiting Corp. and Nash Motor, Crane and American Radiator & Standard Sanitary Corp. buildings.

Steel and the steel industry play a double role in the exposition, having figured prominently in the building of the various structures that make up the fair and in the important developments that are depicted in many industries, in addition to its own.

18,500 Tons in Buildings

Construction of A Century of Progress required about 18,500 tons of structural shapes in addition to a large tonnage of sheets, cable and tubular and other steel products—an impressive total in view of the temporary nature of most of the structures.

Civilization's dependence on steel is strikingly portrayed by the extensive exhibit of subsidiary companies of the United States Steel Corp., located in the mineral industries pavilion of the General Exhibits group. The major display of this exhibit is a huge figure, 40 feet high, made up of exactly proportioned models of ocean liners, automobiles, bridges, skyscraper, locomotives, machines—all kinds of steel-made products.

Topping this group is a model converter. Realistically the converter tips, and throws out flames and sparks as molten metal, apparently, cascades down in a gleaming stream of fire from its smoking maw. As the stream disappears the various models at the base are outlined in detail by concealed lights focused on them.

Around the space under the balcony that encircles the pavilion stretches a ring of life-like scenoramas, forming a colorful background for the actual exhibits of finished steel products. Scenoramas and dioramas, which are used extensively in the World's fair, are the creations of a special art employing the three dimensions of width, height and depth and involving the use of models and background scenes.

Scenoramas showing the processes of steel production are animated. The first of the series reveals an open pit ore mine in operation. Next in order is a blast furnace, then an open-hearth furnace, slabbing mill and rolling mill.

Industrial settings which follow depict the essential roles steel plays in all industry—steel in transportation, steel in the air, steel on the sea, steel in the home and on the farm, steel in industry and commerce and construction.

In the background of each of these displays unfolds the story of the progress of these essentials of everyday life, step by step throughout the past century. A variety of products made of stainless steel occupy another portion of the exhibit.

The entire space, except entrances, devoted to the display of the Inland Steel Co. is sheathed in steel of its own manufacture, including floor, walls, and ceiling. The steel is in its natural state as rolled.

Murals Etched in Steel

Mounted upon the walls are murals 5 feet high depicting scenes of various phases of steel manufacture. These murals are carved in steel by sandblasting and are reproductions of actual photographs taken in plants of the Inland company. They are illuminated, colored and animated by means of lights.

Other features include samples of various steel sections, an exhibit showing progress in the development of the steel rail during the last century, a continuous motion picture of the operation of Inland's new continuous strip sheet mill, and a model reproduction of a skyscraper that reveals the entire steel framework.

Link-Belt Co. also makes liberai use of dioramas in its exhibit in the mineral industries pavilion in portraying the modern methods em-

Bird's eye view of the exposition, looking north toward the soaring towers of the Loop district. The site stretches from Twelfth place to Thirty-ninth street, with Northerly island, built for the exposition, paralleling the shore from Twelfth to Twenty-third streets. Photo copyright by Chicago Aerial Survey Co.

ployed in handling materials mechanically throughout the industries of the world, 25 dioramas in addition to the same number of translite illustrations being employed.

The entire exhibit is enclosed by large ornamental models of conveyor chain links. These models reach to the ceiling, the link forming the main entrance having an entrance width of 22 feet.

In addition there is a display of the company's line of positive drives for transmitting power without slip, including silent, roller, malleable, Promal and steel chains; herringbone and worm gear speed reducers; the P.I.V. gear variable speed transmission; and other gearing in addition to an operating model of the Link-Belt rotary railroad car dumper.

Adjacent to the Steel corporation exhibit is the Armstrong Brothers Tool Co.'s display of various small tools.

Tower and court of the Hall of Science, shown below in a night scene. The court, enclosed on three sides and with a lagoon on the fourth, can accommodate 80,000 *persons*

Robot Talks on Food

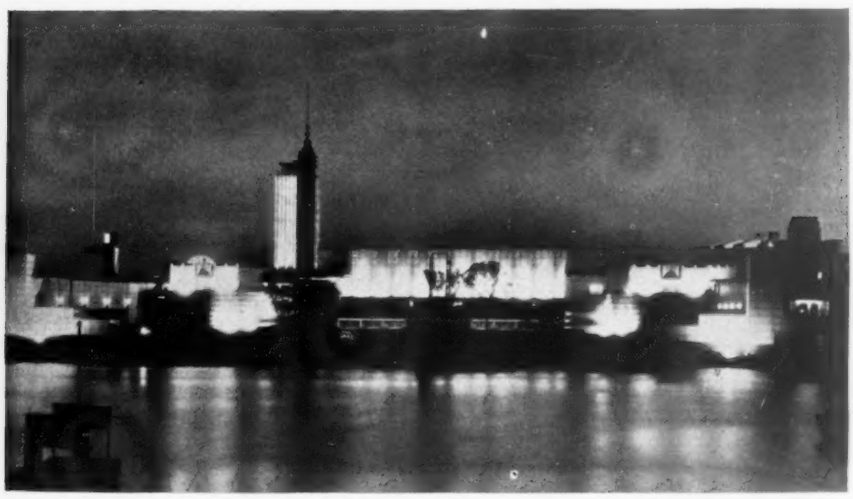
The Hall of Science is a veritable school where displays and actual experiments demonstrate chemical methods of producing dyes, soaps, paints, explosives, paper and food from basic raw materials. Intricacies of physics, mathematics, geology, medicine, surgery and pharmacy are explained and the story of the evolution of animal and plant life told. A large steel robot lectures on food chemistry and nutrition.

The Union Carbide & Carbon Corp. has its exhibit in this hall, showing uses of its various products, including alloys and other metallurgical materials, oxygen and acetylene and synthetic organic chemicals. The company also has furnished a large number of specimens included in a "Periodic Table of Elements," which is made up of samples of all the known chemical elements.

Visitors to the Hall of Science will be able to see among the exhibits a large model in three dimensions depicting the industrial plants and activities of the Union Carbide & Carbon Corp., also minature representations of oxyacetylene welding and cutting outfits.

Other displays of mining products also are shown, including coal, ores, clays, and gems. Diamond cutting and flotation of gold as well as zinc, lead and other metals are demonstrated. Beryllium refining and slate mining are described.

The Copper and Brass Research association tells the story of copper and brass in a large exhibit, while additional exhibits cover aluminum, platinum, molybdenum, cobalt and other elements. Other companies represented include the Bakelite Corp., Cutler-Hammer Inc., Dow Chemical Co., Duriron Co., Fansteel Products Co., Grigsby-Grunow Co., International Nickel Co., Metal & Thermit Co., New Jersey Zinc Co., Raritan Copper Co., and Roessler & Hasslacher Chemical Co.



Night view of the Hall of Science taken from across the lagoon on Northerly island. Illumination of the building and grounds at night is one of the spectacular features of the exposition

Electricity Comes of Age

Electricity has two great buildings of its own, the Electrical building and its connecting structure, the Radio and Communications building. Principles rather than products are stressed. A basic understanding of the working of electricity, from a vast power system to industrial and home equipment, is given by comprehensive exhibits shown in action. Telephone, telegraph and radio communication systems are in operation.

A central station exhibit, sponsored by public service corporations, consists of the largest diorama ever made, 92 feet wide. This diorama is an animated scene with changing lights, running streams and spinning turbines that depict the production, distribution and use of electric power.

General Electric Co. employs about 9000 square feet of the great circular hall of the Electrical building for most of its exhibits. Developments of research laboratories of the company are shown in a series of lectures and demonstrations in a small auditorium— a model theater, devoted to scientific vaudeville, that is air conditioned and illuminated by most modern practice in these fields. In-

cluded in the various acts on the program are demonstrations of the uses of high frequency coils, the photo-electric tube, cathode ray oscillagraph and other electrical devices.

A display of oil furnaces and air conditioning equipment portrays the use of year-round air conditioning with a central unit which controls and provides heating, proper humidity, air cleansing and distribution in the summer. Another section shows air conditioning in individual units by an oil furnace and single-room conditioner for both summer and winter.

Show Mercury Turbine

Other exhibits of the General Electric company include a variety of kitchen and other domestic products; a model of an electric locomotive; industrial motors and control; a model of a 20,000-kilowatt mercury vapor turbine station; a portable welder; mercury vapor lamps and incandescent and sunlight lamps.

Exhibit of the Westinghouse Electric & Mfg. Co. is comprehensive and includes a 23,000-volt lighting arrester and a Deion circuit breaker in operation, a 1500-kilowatt mercury rectifier and a working model of an electric steel mill drive, built to one-twenty-fourth scale. The latter is a twin-motor drive, operating under fully automatic control, rolling "steel" ingots into various shapes. The "steel" is colored wax.

Models of waterwheels, a paper mill and steam turbines also are displayed. Developments and improvements in industrial motor design over the past 40 years are depicted in one exhibit.

Refrigerators and other household appliances, diesel electric drives for railroad and marine use, electric locomotives, mine motor and pipe line pumping applications and motor control equipment are some of the other subjects covered by the Westinghouse exhibit.

Uses of electricity in the modern hospital, its 30 different applications in farming, and its employment in the various important methods of communication are demonstrated in other displays. Century Electric Co., St. Louis, has a motor exhibit, Delta Mfg. Co. shows electrically driven wood-working machinery, Crane Co. an electrically operated valve, and the Electric Storage Battery Co. a display of the various applications of its Exide batteries.

The story of transportation is told in an elaborate setting within the huge Travel and Transport building and dome. The latter has made architectural history, being a structure 206 feet in diameter clear of any obstruction from the floor to its ceiling, 125 feet high. The dome is hung by cables from 12 steel towers.

An almost incredible stretch of mural paintings, animated dioramas, miniature railway systems in operation and displays of the most modern developments of transportation, contrasted with historical exhibits, line the walls of the building.

The Standard Oil Co. of Indiana projects moving pictures from a giant reproduction of the Standard Oil crown, located in the center of the dome, to a ring of screens 30 feet above the floor level. These pictures portray the story of oil's es-

(Please turn to Page 70)

To Offer Steel Shares in Auction of Continental

When the Chase National Bank, New York, on June 12 auctions assets of Continental Shares Inc., which were pledged on a loan of about $30,000,000, 50,000 shares of Cliffs Corp. and 54,796 common shares of Youngstown Sheet & Tube Co. will be offered.

Tied up in this and other bank loans are Continental's holdings of 350,000 shares of Cliffs Corp., nearly half of the outstanding issue of that corporation, which owns all of the stock of the Cleveland-Cliffs Iron Co., the latter in turn owning 62½ per cent of the Corrigan, McKinney Steel Co., which also in turn controls the Newton Steel Co.

Continental Shares was organized by Cyrus S. Eaton. Control of this investment trust passed to a group of Cleveland bankers in 1931.

Bar Iron Wages Considered; Some Sheet Mill Workers Cut

Representatives of bar iron mills having wage scale contracts with the Amalgamated Association of Iron, Steel and Tin Workers will confer with the Amalgamated association's wage committee this month to agree on the year's contract dating from July 1. The committee and representatives of the Western Sheet and Tin Plate Manufacturers' association last week concluded their negotiations, signing contracts reaffirming the past year's scale, with reductions for the higher-paid employes, namely 10 per cent for sheet mill rollers; 7½ per cent for sheet mill heaters, and 5 per cent for shearmen.

See Reorganization of Witherbee-Sherman July 1

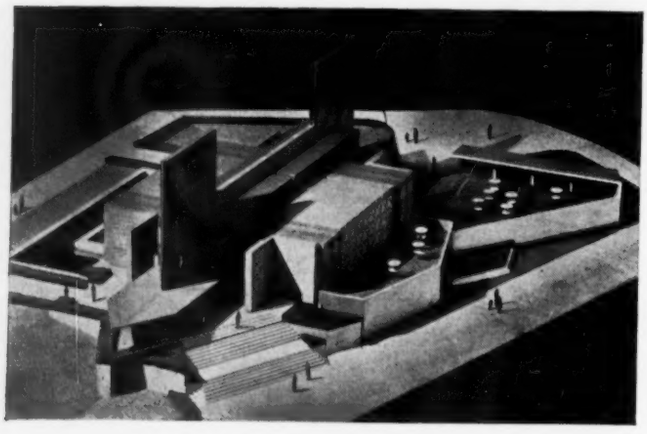
Completion of reorganization of management of the iron properties of Witherbee, Sherman & Co., Port Henry, N. Y., is set for July 1. The properties, valued at $20,000,000, were recently sold at auction for $530,000, but one bid being submitted, that a joint bid of the bondholders and so-called organization committees. The organization committee is represented by James A. Stevenson Jr., of the law firm of Sherman & Sterling, New York, and the bondholders committee by R. Graham Heiner, of Cotton, Franklin, Wright & Gordon, also New York.

Empire Merging Bonds

Pending reorganization of the Empire Steel Corp., Mansfield, O., C. H. Henkel has been continued as receiver by Federal Judge Samuel H. West, of Cleveland. The reorganization plan contemplates merging three Empire bond issues into one 20-year issue, with a total authorization of $3,432,000. In addition to the plant at Mansfield, which is now operating, there are Empire plants also in Ashtabula, Cleveland and Niles, O.

Closes Canadian Unit

Canadian Steel Corp., Ojibway, Ont., the Canadian subsidiary of the United States Steel Corp., has closed for an indefinite period, largely due to market conditions. The Ojibway unit of the Steel corporation, started in 1913, is across from Detroit. Two shells of blast furnaces remain uncompleted. A tin plate plant was erected in 1929 to supplement wire capacity.



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Industrial Groups Prepare for Action on Control Plan

WITH few exceptions, organized groups of the iron, steel and metalworking industry are working feverishly to get ready for the functioning of the national recovery bill.

Activities are being directed toward two objectives: 1. Presenting industry's case before congress to the end that the bill, now in the hands of the senate finance committee, will be freed of provisions inimical to industry. 2. Perfecting and strengthening group organizations so that they may function effectively under the terms of the bill after it becomes law.

In carrying out the first objective, industry's spokesmen in Washington are pressing hard for a revision of Section 7a, dealing with labor relations. As reported elsewhere in this issue, Robert P. Lamont, president, American Iron and Steel institute, has voiced the steel industry's opposition to the closed shop feature of the bill. Representatives of the United States chamber of commerce, National Association of Manufacturers, National Metal Trades, and other general trade associations also, are opposing the present intent of Section 7a. These arguments are summarized on page 21.

Formulate New Codes

As for the second objective, many groups are working on trade practice codes, studying price and cost data, and weighing the unofficial proposals of the government in regard to hours and wages to be stipulated in the codes.

Although his appointment as industry co-ordinator has not been announced, Gen. Hugh S. Johnson is working quietly with the leaders of important industries on provisions of the bill. In the steel industry, common labor has been averaging about 28 hours per week and receiving a minimum of $10, or 36 cents per hour. It is understood that General Johnson first proposed a schedule of four 8-hour days per week with a minimum wage of $15, or about 47 cents per hour. Upon realization that this sharp advance might not be accomplished in one step, the goal is understood to have been revised to around 40 cents per hour. As a result of these conversations, the proposed wage increase now is being discussed in terms of 10 to 15 per cent.

A brief review of what various industrial groups and trade associations are doing to meet the situation follows:

American Iron and Steel Institute

Armed with authority voted at the meeting in New York, May 26, at which executives representing more than 85 per cent of the industry were present, the executive committee of the American Iron and Steel institute has been fast pushing plans for effective co-operation with the federal government, once the pending industrial control bill has been adopted.

Meetings have been held almost daily during the past week, with a result that a tentative program may be ready for announcement within a few days. Questions of trade practice and more particularly the question of wage rates have come in for primary discussion, with indications pointing to a possible advance of 10 to 15 per cent in wages in the near future.

However, much depends as to the final shape of the Institute's program upon the action of the senate in the matter of amendments to the industrial bill. The bill, as it passed the House, was more in the nature of a general statement of intention than anything else, steel leaders declare, a statement subject to varying interpretations. Not until the bill has been further molded into shape (and amendments are believed certain) and adopted as law will the executive committee of the Institute know generally what to expect, and if the delay in getting the machinery provided by the Farm bill into operation is any criterion, some additional time may elapse before full details become crystallized.

Meanwhile, Institute officials are confident they will be ready to go ahead the moment the administration in Washington gives the signal.

American Institute of Steel Construction

Meetings of the executive committee with a small group recently appointed by the committee will be held in New York this week at which time action will be taken on a proposed code. The institute drafted a code several years ago and submitted it to the federal trade commission. Subsequently it made another attempt at self-regulation. In view of its experience with the previous code and with a comprehensive plan of self-regulation the institute is well fortified for meeting the present situation. It is closely in touch with developments in Washington.

American Steel Warehouse Association

A special committee is expected to complete the draft of a code of fair practice early this week. Statistics of the warehouse industry are being prepared and the association is in constant touch with events in Washington.

American Refractories Institute

At a meeting in the William Penn hotel, Pittsburgh, June 1, the institute drafted a code of practice and arranged for adequate representation in Washington in conjunction with the activities of the American Association of Manufacturers in the senate committee hearings.

American Gear Manufacturers' Association

Members met May 31 in preliminary discussion of national recovery act. Association now is drafting a code of practice.

American Oil Burner Association

Has wired the President endorsing the aims of the industrial recovery act and will take up definitely the matter of a trade practice code at its annual convention, Chicago, June 12-16. Such a code has been informally discussed by the executive committee and the matter will be discussed in detail at the convention.

National Metal Trades Association

Is urging that more time be given industry to present its views and stresses these dangers in the bill: (1) Organized labor will demand greater liberty to extend the closed shop. (2) The possibility that any measure passed during the emergency will become a permanent policy.

National Association of Farm Equipment Manufacturers

Has appointed a committee to study situation. Will withhold action until after bill is passed.

Rail Steel Bar Association

Met in New York during week of May 22 and named committee to draw up code for its industry. It is intended to harmonize this code with that of the American Iron and Steel institute. The rail steel bar code will be ready to submit to members in 10 days.

Institute of Scrap Iron and Steel Inc.

Is one of the few associations which has set up a code of fair practice. The industry in May, 1929, formulated a code which condemns practices such as top-dressing of cars, etc., and this has been adhered to rigidly. Benjamin Schwartz, director general, maintains contacts at Washington and it is the plan to build around the code of May, 1929, to accord fully with the provisions and intentions of the industrial recovery bill. Mr. Schwartz is planning to submit at the annual meeting to be held in Chicago during the week of July 3, important recommendations for the enlargement of the code of May, 1929, in order to centralize the marketing of scrap so as to eliminate cross hauling and wasteful competition, also to eliminate direct dealing between consumers and producers of scrap. One of the primary purposes of these recommendations will be to increase employment in the scrap industry.

The Wire Association

Has wired its directors asking for their reaction toward the proposed law, but has not yet received sufficient

replies on which to base action on a code. This association embraces producers in both steel and nonferrous wire plants.

National Association of Flat Rolled Steel Manufacturers

Is observing trend of legislation at Washington, and in connection with a code covering flat steel products is working through the American Iron and Steel institute.

Pressed Metal Institute

Has called a meeting of representatives of stamping industry for 9 a.m., June 24 at Statler hotel, Buffalo, to discuss and take action on national recovery bill.

Stoker Manufacturers Association

Held meeting in New York, June 1. A special committee is drafting a code of fair practice.

Malleable Cast Iron Industry

Is organizing for purpose of dealing with national recovery bill. Code is under preparation.

Gray Iron Casting Industry

Has been holding organization meeting to evolve machinery for meeting requirements of national recovery bill. Gray Iron institute is co-operating through study of cost standards, etc.

Foundry Equipment Manufacturers Association

A committee has been appointed to recommend a course of action.

Cast Iron Pipe Research Association

Is establishing headquarters in Washington in preparation for suitable action.

Steel Foundry Industry

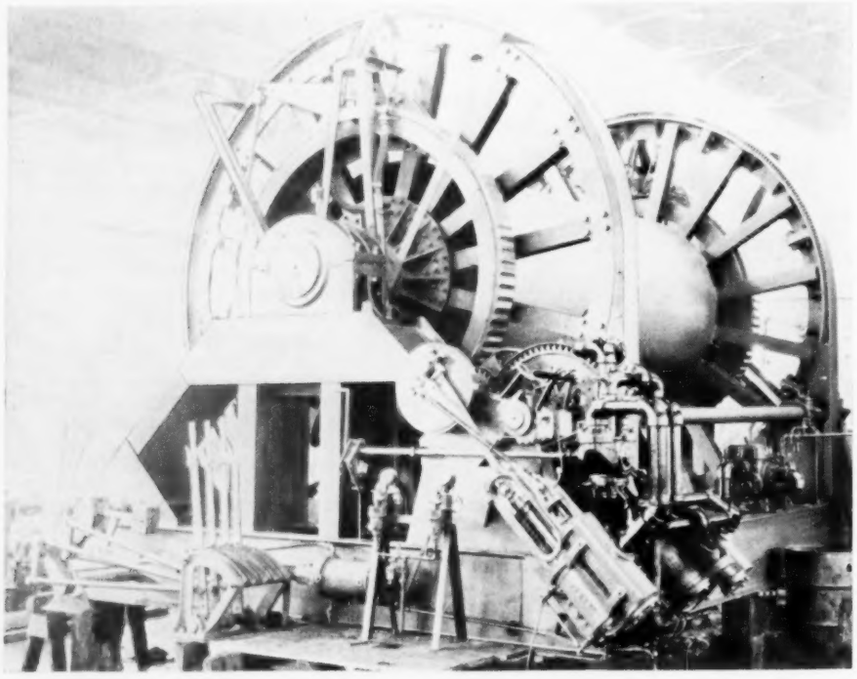
Is actively working toward comprehensive code and other essentials for operation under national recovery act.

National Electrical Manufacturers Association

The board of governors has authorized preparation of a program to meet requirements of the proposed legislation.

A. O. Smith Increasing Beer Barrel Production

The A. O. Smith Corp., Milwaukee, which recently installed equipment for manufacturing steel beer barrels, with capacity of 2000 a day, is understood to be preparing to install three more production units, increasing output to from 7000 to 8000 units daily. Orders are being booked more rapidly than production can be delivered at present. The fact that the country was using between 10,000,000 and 12,000,000 wooden barrels before prohibition and most of that cooperage has disappeared, is given as the reason for the relatively enormous proportions the Smith steel barrel business is assuming.



NO CABLE IS TOO DEEP TO ELUDE THIS ENGINE: Designed by engineers of the Pacific Telephone & Telegraph Co. for laying and picking up submarine cable in the deep waters of Puget Sound, this unique cable reel engine has been constructed to order by the Washington Iron Works, Seattle. It is a steam powered, portable unit, moving on skids. When not in use it is stored ashore and when needed it is placed on a scow and towed to the scene of operations. Total weight is 65 tons, boiler and base weighing 15 tons. It is designed to pay out cable at the rate of 500 feet per minute and to pick up 200 feet per minute. Drum spool is 80 inches in diameter and 14 feet long, made up of steel plate over I-beam understructure. A jaw clutch connects the intermediate shaft to the intermediate shaft gear so the engine may be disconnected when laying the cable. The brakes are 102 inches in diameter and 10 inches wide, designed for a maximum of 50,000-pound line pull when the drum is turning at a maximum speed of 16 revolutions per minute

Employment in Iron, Steel Industry Up in April

Washington—April index number for employment in the iron and steel industry was 51.3, compared with 50.1 for March and 59.8 for April, 1932, taking 1926 at 100, according to the bureau of labor statistics.

For cast iron pipe the employment index for April was 23.5, compared with 19.4 for March and 35 for April, 1932, while in the machine tool industry the employment index for April was 26.9, compared with 27.3 for March and 40.5 for last April.

Employment index for iron and steel forgings for April was 51.3, against 50.1 for March and 59.8 for April, a year ago.

Tin Plate Output in May 145,000 Tons, Up 54%

Production of tin plate in the United States jumped to 145,000 tons in May from 94,000 tons in April, according to the American Bureau of Metal Statistics, representing an increase of approximately 54 per cent.

May output, in addition, was 52 per cent ahead of the 96,000 tons produced in May, 1931, and also exceeded the May, 1930, total of 141,000 tons. Further, the May output was the heaviest since June, 1930, with the exception of only two months, March and April, 1931.

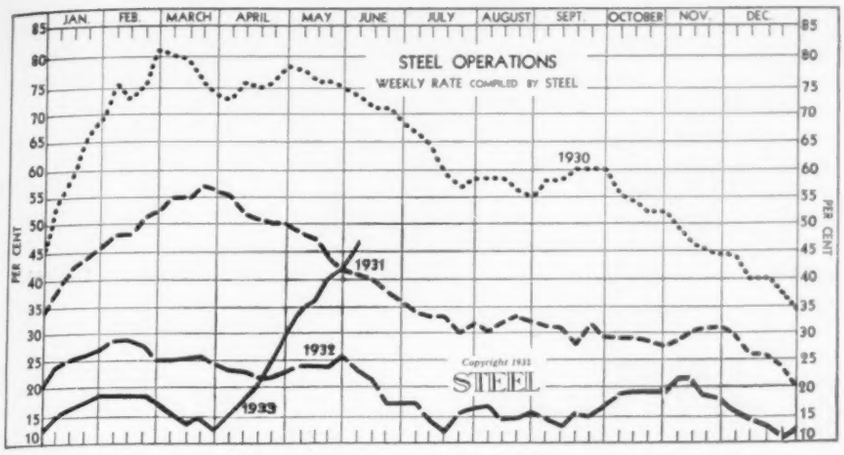
Present indications give promise that tin plate production will show even further expansion during the current month. Operations have increased to near 90 per cent of capacity with some mills running on a capacity basis. Little material reduction is expected from this rate over the balance of the month.

Resumes Furnace Repairs

Colorado Fuel & Iron Co. June 15 will resume the work of relining blast furnace D at the Pueblo, Colo., works. The major overhaul of D furnace was started over a year ago, when a new shell was installed and about half the lining of the furnace and the stoves put in.

Carnegie Tow at Vicksburg

The DUQUESNE of the Carnegie Steel Co.'s Ohio river fleet has arrived at Vicksburg, Miss., with a tow of steel from Carnegie plants in the Pittsburgh district.



Steelworks Activity Now in Shadow of 50%, and Rising

A FURTHER increase of 4 points put the steel operating rate for the week ended June 3 up to 47 per cent, but considering that some capacity is always out of commission for repairs, steelworks can be considered as having crossed 50 per cent of practical capacity. Tentative schedules for the current week include some increases and no reductions.

Wheeling mills continue to lead the country at 80 per cent. Cleveland is a close second at 64, including the Lorain district. The Cleveland rate is an advance of 5 points. Youngstown mills also went up 5 points to 52 per cent, and eastern Pennsylvania 5 points to 24½ per cent. Rates for other districts are: New England, 59; Birmingham, 50; Chicago, 38; Buffalo, 33; Pittsburgh, 30.

Details for various districts follow:

Youngstown

Steel output here last week jumped 5 points to 52 per cent, with 43 of 83 open hearths active. Forty-five furnaces, or 54 per cent of the district's open-hearth units, were expected to be melting at this week's opening. Three of four bessemer plants are operating.

Pittsburgh

Steel ingot production advanced 3 points last week to 30 per cent, with operations of the leading interest's immediate Pittsburgh district plants being at 32. As of late last week, there was an increase of approximately 10 open hearths in the Pittsburgh district, making 60 out of 201 open hearths on. Ten out of 53 steelworks blast furnaces now are in blast, with Carnegie operating 5 out of 32, Jones & Laughlin 4 out of 11, and an independent 1 out of 2. Among finishing mill rates, tin plate is leading at 85 to 90 per cent, followed by sheet, strip and bars at 40 per cent, with other products showing strength.

Cleveland

Steel ingot production here, including Lorain, O., averaged 64 per cent in the week ended June 3, up 5 points. Otis Steel Co. added one open hearth, operating six. Another open hearth was lighted at Lorain, making nine active there. The two 12-ton bessemer converters at Lorain also were operated. Corrigan, McKinney Steel Co. continued with ten open hearths. A further gain is in prospect this week, at least one more open hearth being scheduled.

Chicago

Iron and steel plant operations made a further small advance last week. Another blast furnace was lighted at Gary, giving the district nine active steelworks stacks of 36, six being Corporation and three independent units. One merchant furnace also is in blast. Ingot production rose 1 point to 38 per cent, this rate being expected to hold this week.

American Sheet & Tin Plate Co. has resumed at its Elwood, Ind., plant.

New England

Ingot operations are at 59 per cent, with all producers putting on additional basic open hearths within ten days and assuring a sharp advance in June. Basic open hearth capacity will be close to 100 per cent. One and possibly two acid open hearths also will go in this month.

Detroit

The six open hearths of the Great Lakes division of the National Steel Corp. here remaining on and the 10 of the Ford Motor Co. still being idle, the Detroit steel rate continues at 38 per cent. There is the possibility that some Ford furnaces will be relighted.

Buffalo

District steelworks operated at 33 per cent last week, 12 open hearths continuing in production compared with the year's high of 14 reached and maintained during the first three weeks of May. Present schedules,

Operating Rate of the Steel Industry, by Weeks

All figures except the monthly open-hearth and bessemer ingot totals of American Iron and Steel institute are percentages. Estimates are based upon reports from Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Buffalo, Wheeling, Worcester and Detroit districts, which are weighted. Weeks end Saturday

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	Steel's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.....	22	25	26	27	28.5	25.7	1,454,309	25.86
Feb.....	28.5	27	25	25	....	26.4	1,450,648	26.83
March....	25	25.5	24.5	23	....	24.5	1,403,723	24.04
April.....	23	22	22	23	24	22.8	1,233,603	21.94
May.....	24	24	25.5	23	....	24.1	1,101,994	19.60
June.....	21	17	17	17	....	18.0	893,899	15.90
July.....	14.5	12	15.5	16.5	16.5	15.0	790,055	14.61
Aug.....	14.5	14.5	15.5	14.5	....	14.7	829,236	14.20
Sept.....	13.5	15.5	15	17	....	15.3	971,365	17.28
Oct.....	18	19	19.5	19.5	19.5	19.1	1,064,598	18.93
Nov.....	21	21	19	17.5	....	19.6	1,010,894	17.98
Dec.....	16	15	14	12	13	14.0	843,244	15.00
1933								
Jan.....	15.5	17	18	19	....	17.4	1,008,867	17.85
Feb.....	19	19	19	17	....	18.5	1,064,490	20.40
March....	15	13.5	15	14	15.5	14.6	891,153	15.18
April.....	17.5	20.5	25	29	....	23.0	1,334,797	24.56
May.....	33	36	40	43	....	....	.....	....
June.....	47	..	..	..	....	....	.....	....

subject to adjustment, call for a 33 per cent rate during the week of June 5.

Philadelphia

Steelmaking operations have experienced the sharpest increase in weeks, advancing 5 points to 24-25 per cent. Not only have additional open hearths been put into operation, but those in operation also have been put on longer schedules. In general, this increase reduces the spread that has prevailed of late between steelmaking and production of finished material, although finished steel output has made a further slight gain.

Birmingham

With the rail mill of the Tennessee Coal, Iron & Railroad Co. continuing in operation, the Birmingham district steel rate holds at about 50 per cent.

May Iron Output Best in 14 Months; 13 More Stacks In

BENEFITING from the 10 blast furnaces blown in during April and 13 more in May, production of coke pig iron in the United States in May climbed to a level which was the highest since March, 1932. The average daily rate increased 40.7 per cent over April. Active stacks on the last day of May totaled 61, the largest number operating since February, one year ago. In two months, 23 furnaces have resumed operation.

AVERAGE DAILY PRODUCTION

	1933	1932	1931	1930
Jan.	18,348	31,336	55,337	91,573
Feb.	19,752	33,122	61,114	101,640
Mar.	17,484	31,194	65,448	104,930
Apr.	20,786	28,524	66,986	106,371
May	29,249	25,282	64,355	104,564
June	.....	20,867	54,599	97,817
July	.....	18,394	47,170	85,110
Aug.	.....	17,035	41,264	81,455
Sept.	.....	19,788	38,947	75,893
Oct.	.....	20,795	37,831	69,851
Nov.	.....	20,858	36,727	62,182
Dec.	.....	17,650	31,625	53,732
Av.	21,153	23,699	50,035	86,141

Average daily production was 29,249 gross tons, an increase of 8463 tons over the 20,786 tons in April. To find a rate exceeding this, it is necessary to go back to the 31,194 tons of March, 1932. In May, one year ago, iron was made at a daily rate of 25,282 tons.

Total production in May was 906,725 gross tons, a gain of 283,119 tons, or 45.5 per cent, over the 623,606 tons of April. May was a one-day longer month than April. The May total was the best since March, 1932, with 967,015 tons. In May, one year ago, production was 783,769 tons.

For the five months ended in May, production has aggregated 3,194,196 tons, a loss of 1,344,309 tons from the 4,538,505 tons in the corresponding period of 1932. For five months of 1931, output was 9,460,124 tons.

Relating production to capacity, operations in May were 21.2 per cent, against 15.1 per cent in April and 12.7 per cent in March. In May, 1932, operations were at a 17.9 per cent level.

The 13 stack increase of May over April was the largest gain in any month since January, 1930, when the total increased 17 from 156 on Dec. 31, 1929, to 173 on the last day of January. During May, 13 nonmerchant or steelworks stacks were blown in and 3 were blown out or banked, making a net gain of 10 for this class. Of the merchant class, 3 resumed operation and none was blown out.

RATE OF OPERATION

(Relation of Production to Capacity)

	1933[1]	1932[2]	1931[3]	1930[4]
Jan.	13.3	22.1	38.4	65.0
Feb.	14.3	23.4	42.5	72.1
March	12.7	22.0	45.4	74.5
April	15.1	20.2	46.5	75.4
May	21.2	17.9	44.7	74.2
June	.....	14.7	37.9	69.3
July	.....	13.0	32.7	60.3
Aug.	.....	12.0	28.7	57.8
Sept.	.....	14.0	27.0	53.8
Oct.	.....	14.7	26.3	49.6
Nov	.....	14.7	25.5	44.1
Dec.	.....	12.5	22.0	38.1

[1]Based on capacity of 50,313,975 gross tons, Dec. 31, 1932; [2]on capacity of 51,598,175 tons; [3]on capacity of 52,515,875 tons; [4]on capacity of 51,490,680 tons. Capacities by American Iron and Steel institute.

Furnaces blown in during May were: In Ohio: Ohio No. 4, Carnegie Steel Co.; Lorain No. 5, National Tube Co.; River No. 1, Corrigan, McKinney Steel Co.; one Haselton, Republic Steel Corp. In Pennsylvania: Bethlehem F, Bethlehem Steel Co.; Edgar Thomson G and Farrell No. 3, Carnegie Steel Co.; one Eliza and one Aliquippa, Jones & Laughlin Steel Corp.; Shenango No. 3, Shenango Furnace Co. In West Virginia: One Weirton, National Steel Corp. In Alabama: Pioneer No. 2, Republic Steel Corp.; one City, Sloss-Sheffield Steel & Iron Co. In Indiana: Gary No. 2, Illinois Steel Co.; one Indiana Harbor, Youngstown Sheet & Tube Co. In Illinois: South Works No. 10, Illinois Steel Co.

Stacks blown out in May were: In Pennsylvania: Bethlehem G, Bethlehem Steel Co.; Monessen No. 1, Pittsburgh Steel Co. In Colorado: One Minnequa, Colorado Fuel & Iron Co.

With the Marting Iron & Steel Co., Ironton, O., dismantling its two long idle stacks in Ironton, the number of potential blast furnaces in the United States is reduced from 291 to 289. The Marting furnace, built in 1875 and rebuilt in 1899, had a capacity of 150,000 tons; the Ironton furnace, built in 1908, had 125,000 tons capacity.

MONTHLY PIG IRON PRODUCTION

	1933	1932	1931
Jan.	568,785	971,437	1,715,443
Feb.	553,067	960,550	1,711,192
March	542,013	967,015	2,028,906
April	623,606	855,734	2,009,582
May	906,725	783,769	1,995,001
T'l 5 mo.	3,194,196	4,538,505	9,460,124
June	.....	626,015	1,637,998
July	.....	570,222	1,462,270
Aug.	.....	528,105	1,279,205
Sept.	.....	593,640	1,168,436
Oct.	.....	644,648	1,172,781
Nov.	.....	625,753	1,101,820
Dec.	.....	547,179	980,377
Total	.....	8,674,067	18,263,011

Delivers Barge by Rail

McClintic-Marshall Corp. delivered a 95-foot 159-ton steel barge last week from its Leetsdale, Pa., plant in the Pittsburgh district to Buffalo by all-rail. The barge was taken in three sections, two of which weighed 56 tons and the third 47 tons. Officials of the Pennsylvania railroad said that it was the first time a barge had been delivered by a railroad train.

MAY IRON PRODUCTION

	No. in blast last day of month May	April	Total tonnage Merchant	Nonmerchant
Ohio	19	15	6,567	305,036
Penna.	19	15	39,949*	185,338*
Alabama	4	2	25,501	23,082
Illinois	5	4	22,017	65,140
New York	2	2	.....	29,672
Colorado	0	1		
Indiana	5	3		
Maryland	2	2	.....	130,239
Virginia	0	0		
Kentucky	0	0		
Mass.	0	0		
Tennessee	1	0		
Utah	1	1		
West Va.	2	1	19,469*	54,715
Michigan	1	1		
Minnesota	0	0		
Missouri	0	0		
Total	61	48	113,503*	793,222*

*Includes ferro and spiegeleisen.

WINDOWS OF WASHINGTON

WASHINGTON

ALL roads have been leading to Washington for some weeks, but they have become choked now that industry is fully awake to the revolutionary character of the Wagner national industrial recovery bill.

To the principal objective of the President, as relayed informally to industry by Gen. Hugh S. Johnson, there is little dissent. This is an increase in wage rates and a diffusion of employment.

Iron and steel executives are understood to have been informed that a work week of four 8-hour days and a minimum weekly wage of about $15 is desired. To accomplish this by easy stages, a 10 to 15 per cent advance in the present common labor wage base of 36 cents an hour would be acceptable.

Granting that this would entail a stiff increase in production costs, the administration is understood to offer the backing of the Wagner bill, even going to the extent of licensing to support an advance in the market.

So far so good. But to the labor provisions of the Wagner bill, virtually ruling out company unions from collective bargaining and opening the door to the organization of open shop industries, the opposition is mounting. As forecast in this department two weeks ago, this is the crux of the bill.

Industry States Position

An exceedingly strong stand has been taken by the iron and steel industry, as evidenced by the following statement of R. P. Lamont, president of the American Iron and Steel institute, before the senate finance committee, Thursday. Said Mr. Lamont:

Because of the lack of clearness and definition in the so-called labor clauses in the national industrial recovery act, and doubt as to the meaning and intent of some of the changes made in the bill since it was introduced in the house, and in view of the recently widely published interpretation of and statement concerning these sections, and fearing that silence now might be later misinterpreted, the iron and steel industry has thought it necessary to state clearly its position with reference to these sectons. It makes this statement without any antagonistic feeling or prejudice.

The industry stands positively for the open shop; it is unalterably opposed to the closed shop. For many years it has been and it now is prepared to deal directly with its employes collectively on all matters relating to their employment. It is opposed to conducting negotiations regarding such matters otherwise than with its own employes; it is unwilling to conduct with outside organization of labor or with invididuals not its employes.

The industry accordingly most strongly objects to the inclusion in the pending bill of any provisions which will be in conflict with this position of the industry, or of any language which implies that such is the intent of the legislation. If this position is not protected in the bill, the industry is positive in the belief that the intent and purpose of the bill cannot be accomplished.

By all odds this is the strongest statement yet made on the bill, and serves notice that no unionization of the iron and steel industry will be permitted. No suggestion was made by Mr. Lamont, but there is a considerable undercurrent that any industry seriously opposing the Wagner plan could throw the matter into court, and that the hope of the Roosevelt administration is to obtain the voluntary cooperation of industry.

Also taking a stand against enforced unionization, Charles R. Hook, president of the American Rolling Mill Co., has urged the senate finance committee to amend the labor provisions of the bill to permit company unions and employe representation plans to function.

He also proposed that the President be given authority to protect home industry from foreign competition that will probably be stimulated by higher costs, and suggested a 1 per cent sales tax to finance the $3,300,000,000 public works program.

The National Metal Trades association, through Jacob D. Cox Jr., also is urging industry to protest the labor features of the bill, warning against scrapping the open shop and pointing to the evil times that have befallen the highly-organized railroads.

The National Association of Manufacturers, whose counsels were helpful in softening some provisions of the original bill, assembled almost a thousand executives Saturday.

Despite this mounting wave of opposition, Senator Pat Harrison, chairman of the finance committee, stated Friday he expects to report the bill favorably Monday without any changes except in the tax features of the public works section.

At the White House Friday it was stated that the President continues to stand behind the labor provisions of the bill and does not favor any suggested modification.

Labor Believes Battle Won

Organized labor is proceeding on the assumption that it has won its battle. Delegates from various unions meet in Washington Tuesday to lay out a campaign. One of the most important decisions may hinge on whether to try to organize industries on a horizontal basis or to adhere to the time-honored principle of adhering to crafts.

Secretary of Commerce Roper appears to have won the first skirmish for a greater hand in the administration of the recovery measure. General Johnson's headquarters have been transferred from the state department to the new commerce building, in the midst of the commodity sections of the bureau of foreign and

No Unionization, Says Steel

◆ ◆ ◆

"New Deal" Becomes Reality

◆ ◆ ◆

Road Politics Helps Steel

domestic commerce. Some of these sections may be utilized, it is indicated.

EVENTS have been moving so rapidly in Washington since March 4 that the average business man, struggling to keep abreast of developments directly affecting himself, has been denied a true perspective of the new regime. He literally has been unable to see the forest for the trees.

It has been only 13 weeks since Mr. Roosevelt was inaugurated, but make no mistake, "the new deal" is more than a campaign catchphrase. The grim defeatist feeling that the country was being pushed irresistibly over the brink has been replaced by a lighter, confident spirit—a spirit that is largely the President himself.

The White House today lacks the profundity that was characteristic of Hoover and the cold dignity that was Coolidge. In some respects there is a touch of the easygoing Harding and some of the crusading zeal of Wilson, but reinforced with a practicality and a sense of solidity that both lacked.

New Center of Nation

Not since the world war has Washington, as a city, been so energized. It "has usurped the place of New York in the center of the economic stage," as a speaker said at the recent American Iron and Steel institute meeting. Since March 4, railroad passenger traffic into Washington, especially from the North and West, has increased 50 per cent.

In the course of a month, almost everyone whose name stands for something in business passes through the lobbies of the Washington hotels. During the senate investigation, J. P. Morgan & Co. occupied five entire floors of a leading hotel. Except that there are more automobiles and fewer second lieutenants on the streets, war conditions are duplicated.

The lobbyist and the business man used to a dozen years of contact with Republicans is lost. He finds business men largely discredited. The Roosevelt viewpoint is that business fought a rear guard action against depression for four years, it was unable to concoct any remedy, and it was without a plan when the corner was turned.

The ring of advisers surrounding the President, popularly termed "the brain trust," entertains varying degrees of contempt for business. And this view has not been improved by the disclosure that the only "big business" man in the cabinet was tarred with the Morgan stick.

Mr. Roosevelt himself strikes the keynote of his administration with the word "action" and with it he has invigorated his young advisers. Like radium, these young men constantly are emanating new ideas, and hastening to the White House with them.

Some of these ideas, like the 30-hour work week proposal, spontaneously generate such opposition that they are speedily dropped, and no one is quicker than F. D. (the attempt is being made to duplicate the popularity of T. R.) to drop a hot potato.

Other ideas, such as that of Professor Moley to corral all power possible from congress, and the industrial revival-public works bill, are regarded as classics. The Moley suggestion alone is accepted as justification of "the brain trust."

The first reaction of Washington was that the President was being handled rather completely by this "trust," but this opinion is changing. His political sense in sifting good ideas from bad is acutely developed, and the execution of the good ones he places in the hands of seasoned men.

For instance, Harry L. Hopkins, a trained social worker, controls the $500,000,000 direct relief fund; Arthur E. Morgan, an engineer, heads up the Tennessee Valley Authority; George N. Peek, grounded in farm implements and economics, is administering farm relief; Gen. Hugh S. Johnson, with a background similar to Mr. Peek's probably will be the industrial dictator.

Cabinet officers in the main are figureheads. A course of action suggested, the President operates in much the same manner as the head of a large business; he appoints a committee of advisers and associates best fitted to deal with the matter in hand, and it does not necessarily follow that the interested cabinet officer is on the committee.

Not once during the framing of the industrial revival bill has the name of Attorney-General Cummings been mentioned, although one of the most important provisions of the measure is the waiving of antitrust laws, whose enforcement is committed to Mr. Cummings. In fact, Secretary of Labor Perkins, one of the most influential members of the cabinet, is the only cabinet officer who really "sat in" on the bill.

Cabinet Heads Show Colors

Secretary of Commerce Roper, fretting at the probable dismemberment of his department as part of the economy program, is reported a little disturbed because the administration of the industrial revival bill is not being assigned to his department. But he has won a partial victory with the assignment of General Johnson's headquarters to his department. Secretary Ickes is acquiring a reputation of being antibusiness.

Secretary of the Treasury Woodin was sinking into the background, as a rather natural outcome of the adjustment of the banking situation, when the Morgan investigation cast the spotlight on him. Secretary Woodin and Budget Director Douglas are called "budget balancers" as distinguished from "the planners." The former view every proposal from the standpoint of economy, the latter from the viewpoint of pumping money out into useful work. The inevitable conflicts have not injured the standing of Mr. Douglas with the President.

Three months of the presidency have not turned Mr. Roosevelt's head. His frankness with the press, his unquenchable spirit, his consummate tact in handling vital issues, his adroitness in passing the buck to congress on doubtful issues and making congress like it, continue the marvel of Washington. He has not been impressed by his job, nor in his messages has he developed the tone of a statesman.

The Roosevelt program can be understood when certain fundamentals are kept in mind: Commodity prices must be raised and the condition of labor improved, through increased wages and broader employment. Nor can this program be considered frozen; as with inflation, the suggestion of a certain course often brings about the desired result. The administration's program thus is in a constant state of flux.

Labor Status Uppermost

It would not be accurate to state that the Roosevelt administration is antibusiness, and yet, as has been stated before, every act must be related to labor. It was labor, including the farmer, that put Mr. Roosevelt in the White House, and he is keenly aware that he must continue to merit its support. This feeling crops out in the creed of Mr. Peek in administering farm relief—the farmers must not be reduced to peasantry and the cream that Wall Street has skimmed off business must be shared with labor.

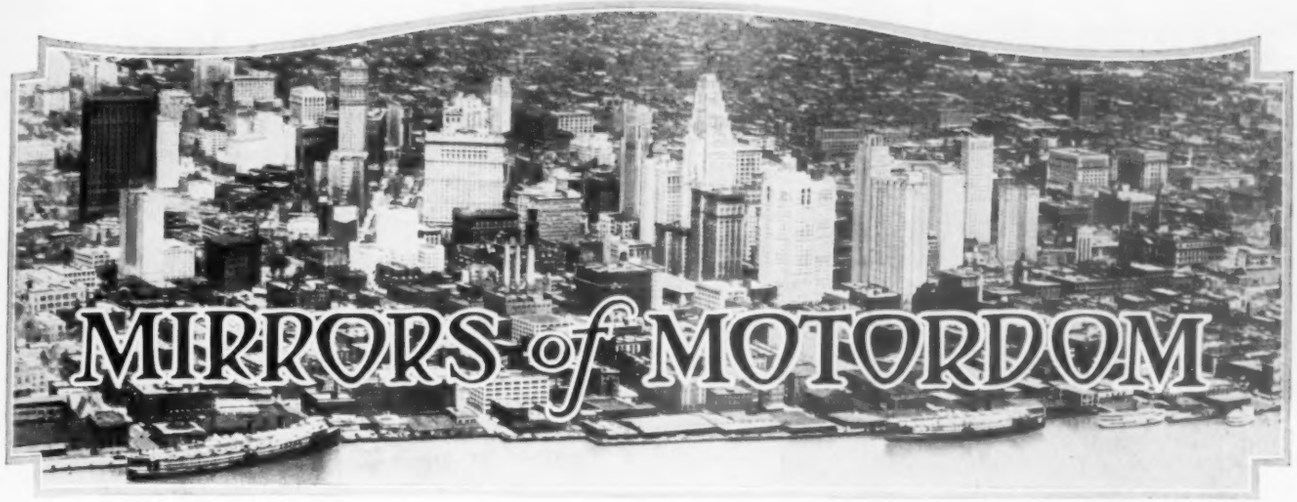
The Baruch influence—both Mr. Peek and General Johnson being proteges of Mr. Baruch—is the nearest approach of business to the President's mind.

IRON and steel can view complacently the politics that will probably result in many eastern states obtaining a larger proportion of the $400,000,000 allotment for highways than was originally intended in the public works section of the Wagner bill.

As a general rule, highways constructed in the eastern states will be of a heavier type, requiring more iron and steel, than those in the western states. Therefore, any attempts to shift more of the proposed $400,000,000 to a population basis will result in more tonnage for the mills. Also, highways in the East can be put under construction in a shorter time and money can be pushed out faster for labor and materials.

The Wagner bill originally contemplated $300,000,000 for highways, allotted on the regular basis and $100,000,000 on a population basis.

(*Please turn to Page* 59)



General Motors Lifts Wages

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Higher Steel Prices Certain

◆ ◆ ◆

Chrysler in Second Place?

DETROIT

PROSPECT of still further improvement in automobile production this month would be enjoyed a little more by both manufacturers of automobiles and sellers of steel if the iron and steel price situation was less uncertain.

As Detroit understands it, Washington has put it up to the steel industry to provide its labor a 32-hour work week and a wage minimum of 40 cents an hour, with the goal a minimum weekly wage of about $15. Obviously, this would increase producers' costs, and the administration is willing that this be passed along to consumers.

An increase in both pig iron and finished steel prices is taken for granted, probably beginning with the third quarter, and the past week has witnessed the most determined effort thus far of automotive consumers to protect themselves ahead.

Two important makers of sheets and strip are reported to have made commitments into the third quarter. Some pig iron and alloy steel also has been sold ahead, but both products usually are sold farther ahead than a single quarter. The brisk demand for cast scrap indicates the coverage automotive foundries seek.

What would happen to third quarter contracts in event a fixed price schedule is adopted is being widely discussed. It is not known that a definite proposal has been made to the automotive industry to raise its own wages and spread employment, but one is expected.

General Motors officials, anticipating such a situation, authorized subsidiaries to raise wages 5 per cent effective June 1. The Olds, Buick, Chevrolet-Pontiac, Cadillac and Fisher Body divisions were first to adopt it, with other subsidiaries to follow.

Thus, confronted not only with higher material costs but also a rise in their own manufacturing and assembling operations, automobile manufacturers are expected to push up their f.o.b. prices. Many makers have hinted at the possibility of an advancement, but the seasoned judgment is that by fall, when labor will have benefited from its improved conditions, the market can better absorb it.

This prospect is not upset by the reductions of $30 to $100 announced May 31 on the DeSoto and Chrysler lines. These adjustments are regarded as a special effort by Chrysler to repeat the success of the Plymouth and Dodge lines.

MEANWHILE, production of automobiles continues to smash all seasonal precedents, and the industry will come up to July 1 with the greatest momentum since 1929. This department forecast that sales would snap back quickly after the banking holiday; it also predicted that May would be strong and June equally good. Actually, the event is outrunning the expectation.

Unless the retail market collapses from some unforeseen cause, June assemblies will exceed those of May, and May approximated 225,000 units. In other words, current activity is equal to the early summer of 1931. The great bulk of cars continues to emanate from the low price field, but the medium and high price lines are now also experiencing some quickening.

Chrysler, carried along on an enormous wave created by its Plymouth line, may elbow Ford out of second place in production this month. A new high monthly record was set by Plymouth in May, with 34,554 units, and on May 24 a daily high was set with 1800 units. The May showing was an increase of 44 per cent over April and 78 per cent over last May.

Probability is that June will at least equal May. DeSoto assemblies have been moved from the Plymouth plant to the Chrysler plant on East Jefferson avenue because of this bulge.

Dodge will not fall far short of 15,000 units in June. DeSoto and Chrysler proper are expected together to exceed 10,000 units, thus giving Chrysler altogether a total of about 60,000 this month.

Ford goes into June with its objective still 2500 units daily, 5 days a week. This also was the goal for May, but some 2300 cars daily was the high water mark. On a 22-day basis, the Ford schedule is 55,000. Only a word is required from Mr. Ford to start buying for quantity production of a small four or eight, and plans for the small six, matured a year ago, have not been mislaid.

Repair work continues on the Ford open-hearth furnaces, and open-hearth grades of scrap produced at Fordson are being stored rather than sold, giving rise to reports of a resumption of steelmaking by Ford.

To correct a condition which is especially noticeable when backing, an additional brace for the front engine mounting is now being installed on the new Ford eight, and dealers are calling in cars already delivered to make this adjustment.

With the co-operation of dealers and partsmakers in the Cleveland area, Ford plans soon to stage there a showing of Ford models and Ford parts made in Cleveland. This plan may be adopted for other districts where Ford parts business is a big factor locally.

On the basis of a report filed with New Hampshire authorities, the Ford loss in 1932 is indicated at $55,161,237, compared with $53,586,000 in 1931. An exact comparison will not be available until the report to Massachusetts is available. The $55,161,237 represents a reduction in

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Industrial Men in the Day's News

F. D. Foote, Assistant to Vice President, United States Steel Corp.

Blank & Stoller Inc.

HE heads up a new Steel corporation activity—co-ordination of railroad sales effort.

A CAREER started in the automobile business now is climaxed with responsibilities in a competitive field of transportation.

PRESIDENT of the Greenville Steel Car Co., he later became head of the company which absorbed it—the Pittsburgh Forgings Co.

A NEWLY-ESTABLISHED department of the United States Steel Corp. will be devoted to the co-ordination of sales effort relating to the railroad industries. In particular, this department will attempt to accord to the railroad field an effective co-operation in problems of mutual interest, especially where commercial, mechanical and physical research in the use and marketing of rolled steel are involved.

F. D. Foote has been appointed in charge of this new department, with the title of assistant to vice president. He has been added to the staff of C. L. Wood, commercial vice president of the Steel corporation. Formerly president of the Pittsburgh Forgings Co. and a director of the American Railway Car institute, Mr. Foote long has been prominent in the railroad equipment industry.

A native of Flint, Mich., Mr. Foote began his business life in the inspection department of the Buick Motor Co. In 1908 he was appointed chief inspector of one of the plants of Weston Mott Co., maker of front and rear automobile axles, since acquired by General Motors Corp. In 1911 he went to Detroit and entered the building business there, but the following year accepted an offer to go with the Greenville Steel Car Co., Greenville, Pa., then a maker of front and rear axles. With this company he served successively as purchasing agent, secretary and treasurer and president.

Mr. Foote's connection with the railroad equipment industry began in 1912, when the Greenville Steel Car Co. undertook a contract for repairing and rebuilding a large number of cars for the Bessemer & Lake Erie railroad. Since then this company has been an important factor in the carbuilding field. The Greenville company became a subsidiary of the Pittsburgh Forgings Co. in 1930. Mr. Foote was elected president of the latter in April, 1932, which office he resigned to go with the Steel corporation.

GUILLIAM H. CLAMER, head of the Ajax Metal Co. and also president and general manager of the Ajax Electric Furnace Corp., Ajax Electrothermic Corp. and Ajax Electric Co. Inc., all of Philadelphia, has been awarded the Joseph S. Seaman gold medal of the American Foundrymen's association. Presentation of the medal will be made during the 1933 annual convention of the association in Chicago, at the annual business meeting June 22.

Mr. Clamer is a past president of the association and a life member of its advisory board. Many of the advances in the chemistry of the foundry industry are the result of his research. He also is a past president of the American Society for Testing Materials, the American Institute of Metals and the Mining and Metallurgical section of Franklin institute. On June 5 he was awarded the honorary degree of doctor of science by Ursinus college, Collegeville, Pa.

□ □ □

Oliver Smalley, recently elected president of the Meehanite Metal Corp., 107 Vandergrift building, Pittsburgh, sailed for England recently for several business engagements.

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James H. Cumiskey, for several years general manager of the Empire Steel Partition Co. Inc., New York, and 20 years associated with the hollow metal industry, has engaged in the business of general contracting as the Northern Contracting Co., with office at Elmhurst, Long Island, N. Y., specializing in residence building construction and alterations.

□ □ □

Alfred E. Kirchgraber has been appointed sales manager of the Buffalo division of the J. M. & L. A. Osborn Co. He has been associated with the company for several years, and previously was with the Republic Metalware Co. at Buffalo.

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Leonard P. Niessen, Cutler-Hammer Inc., Milwaukee, has been elected president of the Milwaukee Asso-

ciation of Industrial Advertisers. He succeeds F. O. Wyse, Bucyrus-Erie Co. J. O. Ferch, Harnischfeger Corp., was elected vice president; Earl E. Lashway, Allis-Chalmers Mfg. Co., secretary and treasurer, and A. J. Andrews, Bucyrus-Erie Co. and E. J. Goes, National Equipment Corp., directors.

□ □ □

A. W. Mace, formerly assistant to vice president, United States Steel Corp., New York, has established his address at Richmond, Berkshire county, Mass.

□ □ □

Henry G. Dalton, senior partner, Pickands, Mather & Co., Cleveland, was honored at an afternoon outdoor party and luncheon, at the Kirtland Country club, Willoughby, O., Thursday, May 25. It was Mr. Dalton's fiftieth anniversary of his association with the firm. All Cleveland employes and many from Chicago and other offices attended the festivities.

Died:

ALLEN M. FOSTER, Cleveland, founder of the Foster Bolt & Nut Mfg. Co. and recently a director of the Lamson & Sessions Co., which in 1930 bought the Foster company, at Cleveland, May 31. Mr. Foster organized his company in 1909, in 1926 building a manufacturing plant in Chicago.

□ □ □

Harvey J. Clark, for many years with the former Lake Erie Bolt & Nut Co., Cleveland, at Bradenton, Fla., May 23.

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David M. Howe, 31, a salesman in the Pittsburgh warehouse of Jones & Laughlin Steel Corp., Pittsburgh, at Bellevue, Pa., May 31.

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Harry E. McLain, 63, president, McLain Fire Brick Co., Pittsburgh, at Pittsburgh, May 25. He was born at New Castle, Pa., in 1868, was active in Pittsburgh Masonic circles and a member of several social clubs in Pittsburgh.

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William Richmond, 85, former mayor of Lockport, N. Y., and a retired machinery manufacturer, May 26 at Lockport. He succeeded his uncle, the late James Richmond, as president of the Richmond Mfg. Co., producer of machinery for the milling trades.

Warehouses and Mills Share Problem of Merchandising Small Lots of Steel

STANDING forth saliently as one of the greatest accomplishments of the steel warehouses during the years of the depression is the well-ordered recession of their prices in a period when prices in many other industries ran amuck and declined precipitously. The contrast between the even tenor of warehouse prices and the sharp breaks that have occurred in some of the mill prices, to a large degree is explained by two factors.

First, ownership management dominates among the steel warehouses.

Secondly, as merchants you have been trained to maintain a reasonable spread between what you pay for your goods and what you sell them for. You have no problems of production, no mills to maintain with all the financial and employment problem incident thereto.

The steel warehouse has turned the corner. We can emphasize this metamorphosis with the simple statement that the number of steel warehouses that were organized for the single and sole purpose of being steel warehouses may be numbered on the fingers of one hand. Almost all steel warehouses trace their inception back to wholesale hardware houses, ship chandleries, fabricating shops, smithies, brokerage houses and what not. Original inventories of galvanized sheets, steel cable, steel beams, sleigh iron gradually were expanded as a convenience to customers until, in not a few instances, the steel departments became the tails that wagged the dogs. As other industries became established and their needs for prompt service on a wide variety of steel products became evident, the business of serving these requirements grew into the distinctive steel warehouses that we know today.

Competition Ills Not New

First recollections of the ills of the warehouse industry, dating back to 1927, are of the bitter complaints about the competition of the mills for small orders. There is not a man in this room who has not had the discouraging experience of watching his warehouse business decline month after month throughout this depression. As monthly bookings fell off, the dreaded bugaboo of more harassing mill competition has, no doubt, arisen to mock your most earnest efforts to hold your old customers and to make ends come somewhere near to meeting. Is there any one of you who questions the statement that the mills, during the months of the depression, have vastly increased their activity in soliciting small orders and that this has been done to the detriment of the warehouse business?

Each year the steel mills provide us with figures from their sales records showing to what industries their tonnages have been distributed during the preceding year. The 1932 data came from 84 steel mills whose shipments comprised over 98 per cent of the total for that year.

In 1929, of the total finished steel produced in the United States, 11 per cent was distributed through steel warehouses. In 1932, this percentage rose to 16.2.

But to get a clearer and fairer picture of the participation of the warehouses in the steel tonnage actually available to them, the only reasonable thing to do is to elimilate from our comparisons and calculations that tonnage which is undeniably mill business and cannot in any conceivable fashion flow through the secondary steel distributor. In other words, we should eliminate all the steel that might reasonably be expected to be sold outside of the natural warehouse markets and shipped direct from the mills to the consumers.

Of this remaining free-for-all business—business available to mills and warehouses alike—17.3 per cent was sold through the warehouses in 1929. This compares with 11 of the total, as stated previously.

In 1932, the warehouses took 23 per cent of this natural available business as compared with 16.2 per cent of the total in that year.

Of course the significant development is that the relative position of the steel warehouses improved from 17 per cent in 1929 to 23 per cent in 1932.

Instead of taking more than their usual share of the miscellaneous tonnage as had been confidently expected, the mills actually have been getting less and less each year. In 1929 this scattered tonnage, after the eliminations previously outlined, amounted to 13,295,000 tons; of this

(*Please turn to Page 68*)

From an address by Walter S. Doxsey, editor of Daily Metal Trade, before the American Steel Warehouse association at New York, May 23.

EDITORIAL

Industry Alive to Import of National Recovery Bill

AFTER several weeks of apparent apathy to the government's proposal to enter into a partnership with business, industry today is thoroughly aroused to its importance. As outlined on page 17 of this issue, many of the important divisions of the iron, steel and metalworking industry are rushing preparations for activity under the national recovery bill.

Most of the groups are formulating codes of practice to be submitted to the President for approval. In certain subdivisions of industry, trade associations are being strengthened to cope with the new situation. Many organizations are working on price classifications, cost data, wage scales and other details preparatory to working more harmoniously under the new rules. Still more important is the fact that all of the groups, with only a few exceptions, are watching developments at Washington closely, now that they realize the tremendous significance of the pending legislation.

This sharply accentuated interest has developed none too soon. For several weeks a small force of industry's representatives has been holding the fort at Washington against the superior strength of entrenched lobbyists who would like nothing better than to hog-tie industry through the agency of the national recovery act. Industry's outposts at Washington have performed a valuable service in holding the lines until reinforcements arrived. Thanks to their alertness, most of the questionable details of the proposed bill have been discovered and their potential danger emphasized.

Intelligent Direction Needed To Assure Positive Aid to Industry's Recovery

Now, with the strength of industry being mobilized rapidly for action, it is important that it be directed intelligently so that the recovery bill will actually aid recovery rather than retard it. The major industries, including the steel industry, were wise in approving the objectives of the act in principle. However, they will be unwise if they fail to follow through on the details, particularly in regard to the obnoxious features of the bill.

In reality, industry's work is barely begun. The bill, as passed by the house, is unsatisfactory. Section 7 of Part I, providing for what is virtually forced acceptance by industry of the closed shop policy, if made part of the law, will incite controversies so destructive as to imperil the possible benefits of the other provisions of the act. The effect of the bill upon foreign trade and its connection with the tariff requires further study and clarification. The danger that the measure, while intended for use only during the emergency, will become a permanent policy should be considered. Some of the features of Part 2, dealing with the public works program and with methods of taxation, also deserve the close scrutiny of industry.

While this is being written (Friday), industrial executives are meeting in Washington to discuss some of the problems mentioned in the preceding paragraph. It is quite probable that in view of the brief time remaining for presenting arguments to the senate committee, industry's spokesmen may ask for a delay in order that the bill may be given more intelligent consideration before it becomes law. Unless the objectionable features of the proposed act can be ironed out in the few remaining days of debate, such delay would seem to be fully justified. It will be far better to eliminate serious flaws in debate than to try to deal with them after the act is functioning.

Steel Industry Moving To Meet Situation; Constant Vigilance Price of Safety

Regardless of the senate's action on the bill, industry should continue to overhaul the machinery of its trade associations, so that it will be able to act promptly if necessary. The American Iron and Steel institute, at its recent meeting, met the situation squarely by approving the government's proposal in principle and by winning the authority of steel company executives to empower the institute's executive board to negotiate a code of practice. By virtue of this action, the steel industry now is in position to carry through on a par with other important industries in its dealings with the government.

Industry faces an experiment charged with opportunity and danger. Intelligent action now may save trouble and heartaches later on. Close attention to the safeguarding of its interests is the most important task the steel industry has faced in many decades. It should continue to marshal all its resources to meet this test of its resourcefulness.

THE BUSINESS TREND

Substantial Character of Upturn More Apparent

JUNE starts off with industrial activity at a rate that has not been equaled in two years. In most lines, the gains of recent weeks not only have held, but have received additional impetus. One possible exception is the automobile industry, in which production dropped slightly in the week ending May 27, and again was off in the week ending June 3, due to the holiday on May 30. Whether or not this is the forerunner of the normal summer recession remains to be seen.

The most encouraging feature of the good showing of the steel industry in May is the fact that a broadening of demand was indicated in the orders of the last half. Faint signs of improved buying for railroads and building construction—two important consuming lines which have been dormant—now are appearing. Freight car loadings made another slight gain in the week ending May 20 and the 1933 line now is almost 4 per cent above the 1932 line.

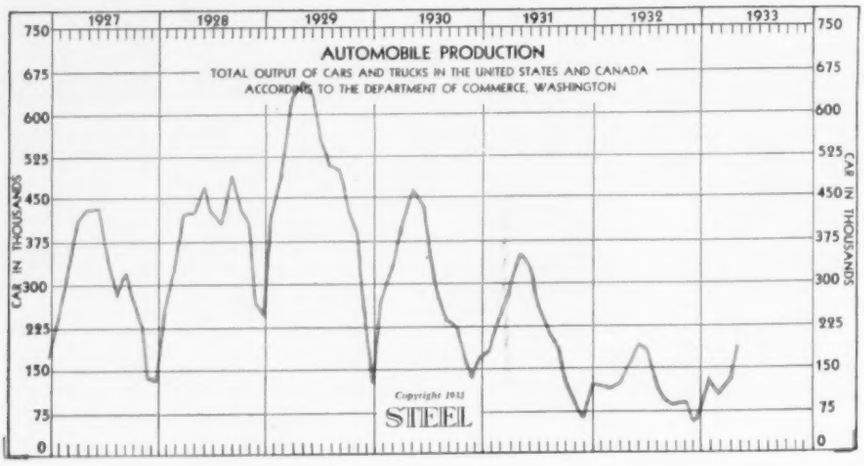
The government's so-called "private business chart," involving indexes of industrial production, factory employment, freight car loadings, department store sales and building contracts bears out the statement made in this column last week to the effect that gains in employment have not matched gains in production.

Industrial Production Surges Far Ahead of Employment in Upturn of Recent Weeks

In April (last figures available) the index of industrial production was 67 against 60 in March, while employment in April was 57.7 compared with 56.6 in March. The 7-point gain in production compared with a 1.1 point gain in employment indicates how generally industrial activity must spread before the problem of unemployment is eased appreciably. This may explain, in part, the emphasis placed by Washington upon the early restoration of labor's compensation and its buying power.

1933	
April	67
March	60
Feb.	64
Jan.	65

1932	
April	63
March	67
Feb.	69
Jan.	72



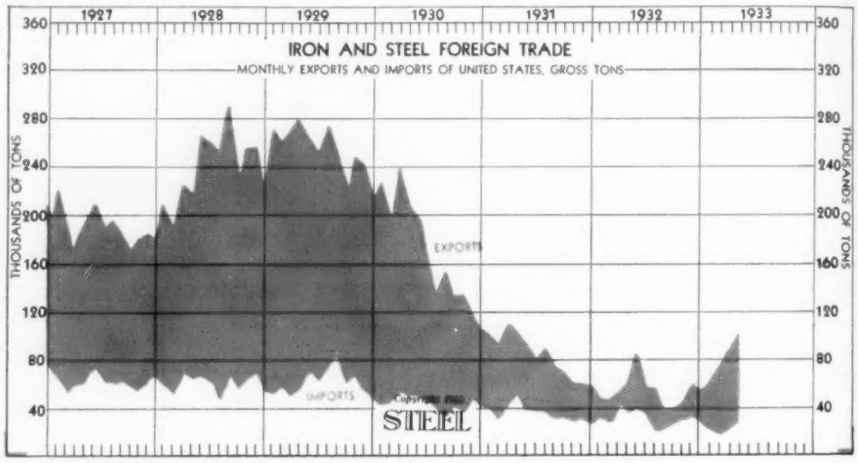
April, 1933	189,284
March, 1933	125,241
April, 1932	155,136

Automobile Production Steps Up in April

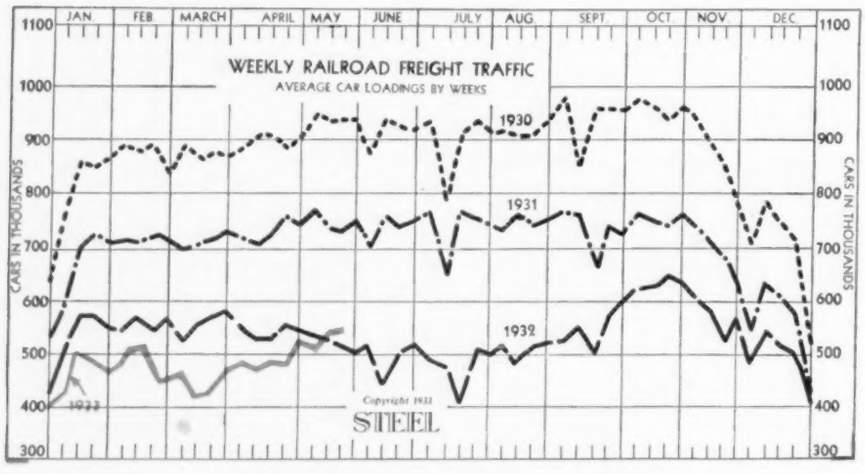
Production of passenger cars and commercial motor vehicles in the United States and Canada advanced sharply during April, rising to the highest level for any month since June, 1932. According to the current report from the United States department of commerce, the April output totaled 189,284 units. This is a gain of 64,043 units over the previous month and compares with the 155,136 units produced in April, 1932.

Iron and Steel Exports Gain; Highest in Two Years

The heavy trade in scrap was largely responsible for the continued rise in iron and steel exports during April. According to statistics compiled by the iron and steel division of the department of commerce, exports advanced to 100,395 tons, the largest since April, 1931, and exceeding exports of April, 1932, by a margin of 73 per cent. Imports were 28,061 tons, 5947 tons over those of March, but below the 35,935 tonnage of April, 1932.



Exports		Imports	
April, 1933	100,395	April, 1933	28,061
March, 1933	80,567	March, 1933	22,114
April, 1932	58,086	April, 1932	35,935



	1933	1932
May 20	531,618	515,628
May 13	531,095	517,260
May 6	423,819	533,951

Car Loadings Increase; Hold Above 1932 Level

Loading of revenue freight for the week ending May 20 totaled 531,618 cars, according to the weekly report of the American Railway association. This is an increase of 523 cars above the preceding week. While this current expansion in freight traffic was not as impressive as the 7276 cars gained last week, it did mark the second consecutive week in which loadings have held to a level above a year ago. It was, however, a decrease of 223,120 cars under the same week in 1931.

THE accompanying article is a paper to be presented at the semiannual meeting of the American Society of Mechanical Engineers in Chicago, June 26-29. The author, Herbert R. Isenburger, is secretary, St. John X-Ray Service Corp., New York. This paper is published in advance by special permission of the society.

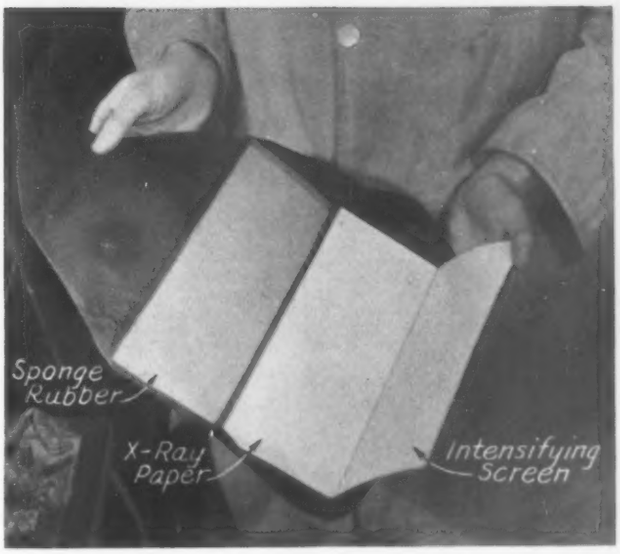


Fig. 1—The complete X-ray camera or folder consisting of X-ray paper, one intensifying screen and sponge rubber

RECENT PROGRESS IN THE X-RAY INSPECTION OF WELDS

BY HERBERT R. ISENBURGER

CONSIDERABLE progress has been made in X-ray inspection of welded structures during the past two years. This progress has resulted from two definite sources; first, experience gained through extensive use of X-ray methods and thus suggesting the way to the second, new developments. Both point to more economic use of X-ray inspection. Outstanding among recent developments which promise to further the use of weld inspection by X-rays are perfection of an inexpensive sensitive X-ray paper, and introduction of a new type X-ray equipment, designed specially for use in the industrial field.

In referring to X-ray inspection of welds, we think of the A.S.M.E. boiler code. New developments should find their reflection in changes in the code specification; particularly should gains in experience result in progressive revision. That this has been the case can be observed from the recently proposed changes presented in the April, 1933, issue of *Mechanical Engineering*. In pressure vessel construction, fusion welding is employed. A number of methods are in use, but no attempt will be made to discuss them here. It is interesting to observe how welds with various cross-sections show up in an exograph. For our purpose, six plates were furnished by the Metal & Thermit Corp., New York, for which acknowledgment is made.

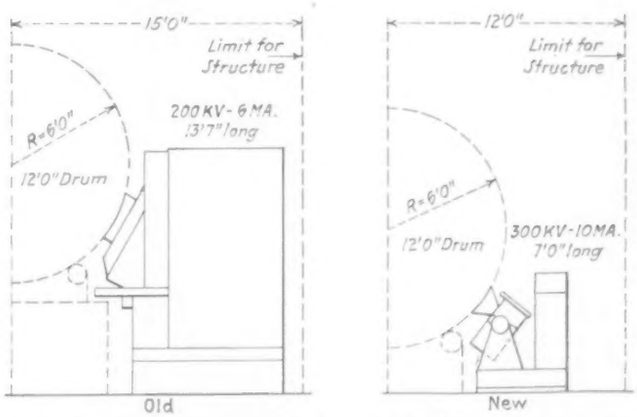


Fig. 2—The conventional type of 200-kilovolt X-ray installation is shown at the left and the new 300-kilovolt portable equipment at the right. Both are set up for inspecting 12-foot diameter welded pressure vessels

The welds are identified as: Plate No. 1—¼-inch straight gap, butt weld; Plate No. 2—⅝-inch straight gap, butt weld; Plate No. 3—1-inch 50-degree, single vee, butt weld; Plate No. 4—1-inch straight gap, butt weld; Plate No. 5—1½-inch, 60-degree, single vee, butt weld; and Plate No. 6—2-inch straight gap, butt weld.

All specimens were welded with 3/16-inch heavy mineral coated electrodes and all straight-gap welds

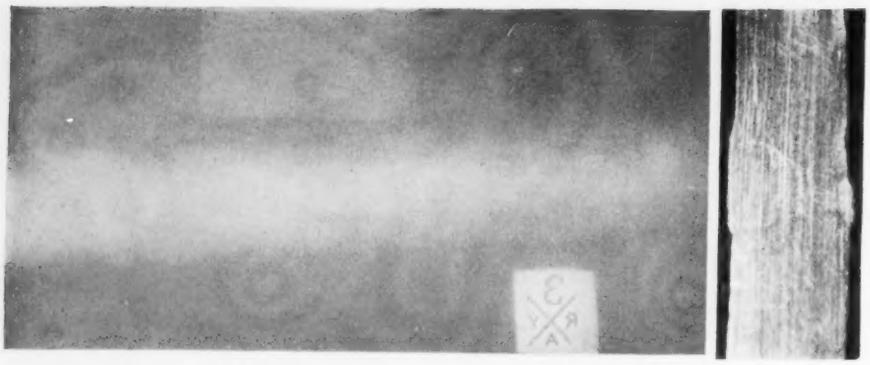


Fig. 3—Exograph of welded steel plate No. 3. A photograph of the cross-section of the weld is shown at the right

were made with ½-inch gap and oxy-acetylene cut sides. All plates were X-rayed under identical conditions which were constant throughout the tests with the exception of the voltage applied to the X-ray tube. The voltage was changed to suit the particular plate thickness. Plate No. 1 was examined without the use of intensifying screens; otherwise, the conditions were as follows: Exposure time, 1 minute; current through X-ray tube, 4 milliamperes; focus-film distance, 24 inches.

The relative voltage for the different plates were determined from the exposure charts shown in Fig. 4. X-ray paper was used instead of film. Since the paper is coated on one side only, the front screen was eliminated and the emulsion side of the paper kept in intimate contact with the intensifying screen. The complete X-ray "camera" is illustrated in Fig. 1. Previous tests have shown the same results to be obtained with paper as with film under identical exposure conditions. Details of these tests will be reported by Ancel St. John and the author in a paper, "Relative Merits of Film and Paper for Industrial X-ray Work," to be presented before the annual meeting of the American Society for Testing Materials in Chicago, June 26-30.

Studying the Exographs

In all tests of the welded plates previously mentioned, the 2 per cent marker was plainly noticeable. Unfortunately, the loss of contrast in reproducing these negatives makes it difficult to present illustrations for these tests. Figs. 3 and 5 show exographs of plates Nos. 3 and 4, respectively, also photographs of cross-sections of the welds. In these exographs a 4 per cent marker was used to obtain a proper reproduction. The cross-section photographs, at the right in the illustrations, enable us to compare the shadow image of the excess beads on both sides of the plates in the exograph.

All these welds are generally sound and do not warrant special comment. Any imperfections show up as darker spots. As to the quality of the negatives, they are just as good as film negatives. The use of X-ray paper, however, has considerable advantages over that of celluloid film. The price for paper is less than half the cost for film, thus reducing the total inspection cost considerably, as we shall see later. Instead of a pair of costly intensifying screens only a single screen is required, unless we want to expose two sheets of paper simultaneously, in which case two back screens are used in front of each other with the sensitive emulsion side of the paper in close contact with the face of the screens, and the rough uncoated side facing the X-ray tube. This has the added advantage that one exograph can be retained while the other goes along with the material.

We have made extensive tests with different screen combinations and found the one just described most suitable. We obtain a slightly fainter picture on the second sheet of paper, but the contrast is absolutely the same as in the first sheet and the 2 per cent marker noticeable in both cases. On thicknesses above 2 inches of steel, it is advisable to increase the regular exposure time about 10 per cent to obtain a good density on the second sheet.

Paper Handled Quickly

For industrial use, paper is particularly suitable, since it can be viewed much easier and at any place without the necessity of a special viewing box. The paper negative can be examined the moment it is in the hypo, that is, a few minutes after the exposure is made, since the development takes only 3 minutes at 68 degrees Fahr. Paper requires the same processing procedure as film, but dries faster, is easier to handle and safer to use. It can be reproduced rapidly and inexpensively by making photostats. There is practically no loss in contrast and in details; in fact, the results are better than when making prints from film negatives. Introduction of X-ray paper represents a distinct advance in the art of metal radiography in gen-

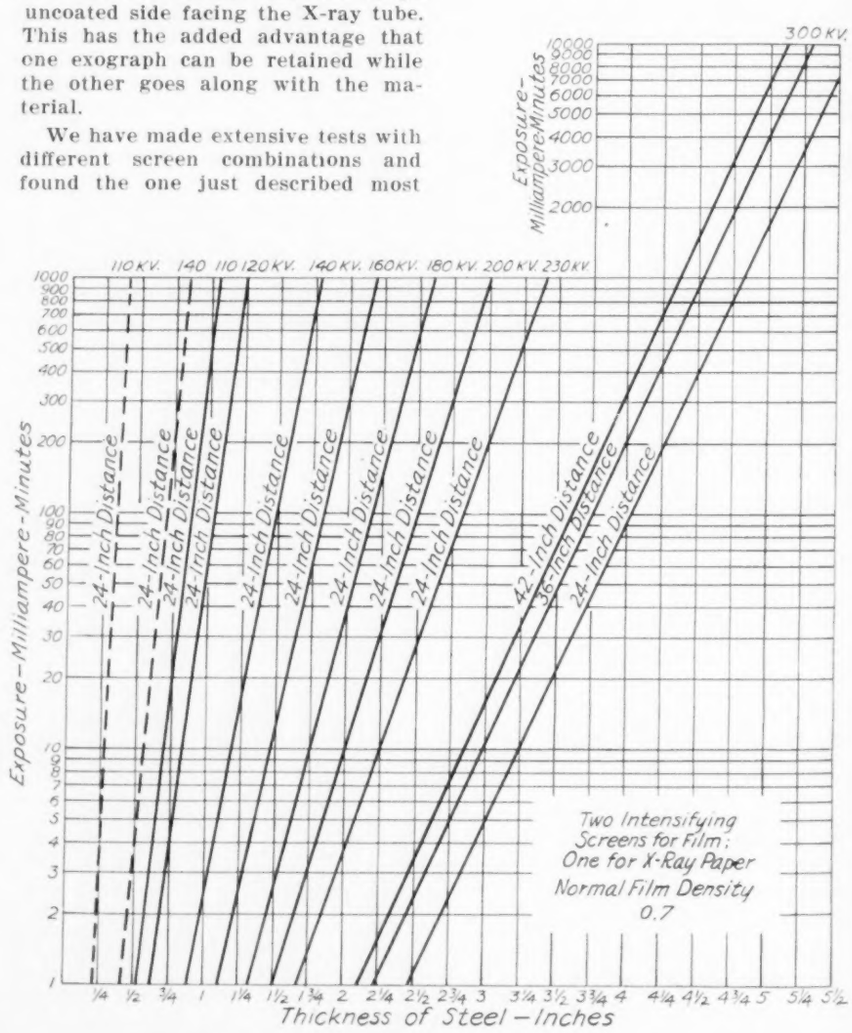


Fig. 4—X-ray exposure charts for steel

eral and to weld inspection in particular.

Apparatus Immersed in Oil

Up to the present, the regular medical X-ray machines had to be utilized for industrial installations. This made a bulky and complicated construction necessary. X-ray equipment manufacturers could not be persuaded to develop an outfit which is particularly built for industrial purposes. The need for such apparatus was so great, however, that Dr. St. John decided to design his own equipment. This undertaking was particularly necessary because European manufacturers had built industrial X-ray equipment which, although not at all ideal or suitable for our needs, was looked upon by users of the X-ray inspection method in this country as a solution.

The important features which an industrial X-ray unit must possess are compactness, rigidity, portability and ease in operation. Dr. St. John accomplished these by putting the entire equipment in a single tank immersed in oil. Thus the transformers, condensers, rectifiers and X-ray tube are all housed in a single lead-covered tank with a small opening opposite the target of the X-ray tube to allow the escape of the useful X-ray beams. All components are built in so rigidly that the unit can be used in any position desired, even upside-down. It is completely shock and X-ray proof.

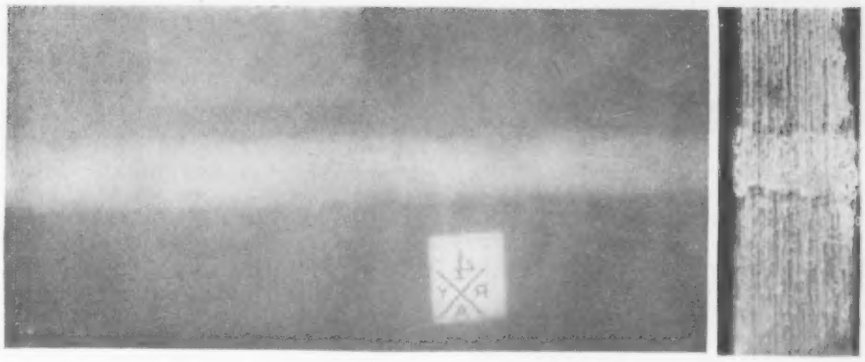


Fig. 5—Exograph of welded steel plate No. 4. A photograph of the cross-section of the weld is shown at the right

A unit of this type for continuous operation at 400,000 volts and 10 milliamperes is only 6 feet long, less than 2 feet wide and 3 feet high. Mounted on a trunnion support, it can be used in the boiler shop; set-up on a little trailer it can readily be shipped from one factory to another and used for field inspection; or slung from a derrick it will serve for ship hull or vertical tower inspection. It is interesting to visualize the actual size of this powerful unit by comparing it with the regular-size equipment now in use in the boiler shop. Fig. 2 shows the old 200-kilovolt X-ray installation and the new 300-kilovolt unit, each set-up on 12-foot diameter boiler drums. The great difference in size is obvious.

Considering that the new St. John outfit is portable, that it is only one-quarter the size of the old and yet much more powerful—3 inches of steel can be X-rayed in a 1-minute exposure, whereas half an hour is required with the 200-kilovolt machine—that it is contained in a single tank and is of much sounder electrical construction, we feel that it marks an important advance.

Comparing Equipment Costs

Performance of the new machine is noteworthy since the operating cost on 2-inch material, for instance, is less than that with the 200-kilovolt equipment. In this connection, a fair analysis of the total operating expense of X-ray inspection of welded pressure-vessels may be interesting. Let us consider three different classes of X-ray equipment—one operating at 120 kilovolts and 5 milliamperes; one at 230 kilovolts and 6 milliamperes; and one at 300 kilovolts and 10 milliamperes. The approximate purchasing price for this equipment is itemized in Table I.

Table II shows the operating cost for the three classes of installations. The complete amortization is divided over a period of five years, not counting the interest on the investment. Insurance, electric current and possible repairs are expressed in the up-

Table I

Approximate Purchase Price of X-Ray Equipment

Class	Milli-amperes	Kilo-volts	Purchase Price	Tube Price	Local Construction	Dark Room	Total Cost
1	5	120	$1,000	$150	$850	$1,000	$3,000
2	6	230	3,000	260	1,740	1,000	6,000
3	10	300	5,000	500	3,500	1,000	10,000

Table II

Operating Cost for Three Classes of Equipment

		Cost				
Class	Amortization	Upkeep	Salaries	Yearly	Monthly	Hourly	Per 1-Minute Exposure
1	$ 600	$ 500	$1,780	$2,880	$240	$1.20	$0.02
2	1,200	800	2,320	4,320	360	1.80	0.03
3	2,000	1,300	2,460	5,760	480	2.40	0.04

Table III

Actual Cost of X-Ray Seam Inspection

Plate Thickness, inches	—Per Single Exposure— Class 1	Class 2	Class 3	—Per Longitudinal Seam— Class 1	Class 2	Class 3	— Per Girth Seam — Class 1	Class 2	Class 3
½	$0.02	$0.03	$0.04	$ 0.60	$ 0.90	$ 1.20	$1.55	$ 2.25	$ 3.05
1	0.20	0.03	0.04	2.40	0.90	1.20	4.40	2.25	3.05
2	....	0.03	0.04	....	0.90	1.20	....	2.25	3.05
3	....	1.50	0.04	....	15.60	1.20	....	25.80	3.05
3½	....	....	0.18	....	....	2.60	....	....	5.30
3¾	....	....	0.40	....	....	4.80	....	....	8.80
4	....	....	0.80	....	....	8.80	....	....	15.20
4¼	....	....	2.00	....	....	20.80	....	....	34.40

Table IV

Actual Cost of X-Ray Seam Inspection

Plate Thickness inches	Three Longitudinal Seams Class 1	Class 2	Class 3	— Four Girth Seams — Class 1	Class 2	Class 3	Four ¼th Girth Seams Class 1	Class 2	Class 3
½	$1.80	$ 2.70	$ 3.60	$ 5.20	$ 9.00	$ 12.20	$2.75	$ 4.05	$ 5.45
1	7.20	2.70	3.60	17.60	9.00	12.20	5.60	4.05	5.45
2	....	2.70	3.60	....	9.00	12.20	....	4.05	5.45
3	....	46.80	3.60	....	103.20	12.20	....	27.60	5.45
3½	....	....	7.80	....	....	21.20	....	....	7.70
3¾	....	....	14.40	....	....	35.20	....	....	11.20
4	....	....	26.40	....	....	60.80	....	....	17.60
4¼	....	....	62.40	....	....	137.60	....	....	36.80

keep. The salaries provide for an operator and helper. The final hourly figures are minimum prices for full-time operation at 200 hours per month; they are exclusive of handling and labor overhead. If the X-ray equipment is not used continuously, the cost for its upkeep will be less, and if the operating crew is not kept busy with the inspection, they can do some other work in the meantime, thus reducing the salary figure. If the equipment is in permanent use day and night, working more than 200 hours a month, the operating cost will be considerably reduced.

Calculating Inspection Costs

After having thus obtained a basis for calculation, let us consider the examination of a pressure vessel 40 feet long, having three 10-foot longitudinal seams and four girth seams. The outside diameter in each case shall be four feet. According to the A.S.M.E. code specifications, only one-quarter of each girth seam needs to be inspected, which of course is poor practice, since there is no guaranty that the remainder of the seams is perfect. In our calculation, therefore, we consider both possibilities, particularly since many purchasers request complete inspection. We cover each longitudinal seam with 10 exposures and allow 2 minutes for shifting film holders and equipment between exposures, which in most cases can be done in less than half that time. For setting and marking up the vessel, we allow 3 hours in each case. We can examine the complete girth seam in 16 exposures, 1 hour extra for handling in each case. The accompanying tables III, IV, V and VI show the actual cost for vessels ranging between ½ and 4¼ inches in plate thickness.

When two sheets of paper are exposed simultaneously, 5 per cent of the total cost has been added for extra handling and processing of the paper, and for 2 inches and greater plate thickness this was increased another 5 per cent on account of the longer exposure times required. All figures do not provide for re-exposures, when necessary. A 10 per cent factor should be added for this purpose when estimating on radiographic work. Since our figures represent the cost under very favorable working conditions, they may be higher in actual practice, depending on the extent to which the equipment is being used and on the handling and labor overhead. In the tables, focus-film distance up to and including 2 inches is 24 inches; for 3 inches the distance is 28 inches; for 3½, 3¾ and 4 inches, it is 36 inches; and for 4¼-inch plate stock the focus-film distance is 38 inches.

Table VII presents comparative costs of X-ray paper and film according to the application and extent of inspection. Total final cost of inspection per vessel, using paper and film, is shown in Table VIII.

Costs Lower Than Presumed

The figures in general show that the cost for X-ray inspection is much lower than usually presumed. The cost is minor when using the inexpensive paper. Considering the added advantage of proving to the customer that the welded material he is purchasing is perfectly sound, it would seem that manufacturers of welded boilers which do not fall into the Class I welding group of the code nevertheless will find it advisable to offer X-ray inspected equipment. As a matter of fact many users of welded boilers, welded penstocks, and even welded sewer pipe request that the welds should be X-rayed. They believe that the thinner the plate stock, the more essential is perfectly sound material, because if the welds are defective in such thin material they will fail quicker in service than would welds in heavier plate stock with sufficient sound metal between a defect and the surface.

Another important application of X-ray inspection which has been made possible by the development of this new portable outfit and X-ray paper, is field inspection of welded vessels which have been in service for many years. Serious defects are liable to develop in time while the equipment is under continuous strain and stress of service. This fact has been recognized in Europe where boilers in ships, power houses and chemical plants are being examined. This is particularly true in cases where the equipment was not X-rayed prior to its installation. Oil stills, paper digesters and similar equipment should be checked-up periodically by means of X-ray inspection.

Table V

Actual Cost of Complete and Code Inspection

Plate Thickness, Inches	Complete Vessel — Class 1	Class 2	Class 3	Complete Vessel per Code — Class 1	Class 2	Class 3
½	$ 8.00	$ 11.70	$ 15.80	$ 4.55	$ 6.75	$ 9.05
1	24.80	11.70	15.80	12.80	6.75	9.05
2	....	11.70	15.80	....	6.75	9.05
3	....	150.00	15.80	....	74.40	9.05
3½	....	....	29.00	....	....	15.50
3¾	....	....	49.60	....	....	25.60
4	....	....	87.20	....	....	44.00
4¼	....	....	172.00	....	....	99.20

Table VI

Preferred Class of Complete and Code Inspection

Plate Thickness, Inches	Preferred Class	Handling and Marking	Complete Vessel	Complete Vessel per A.S.M.E. Code
½	1	$3.60	$ 11.60	$ 8.15
1	2	5.40	17.10	12.15
2	2	5.40	17.10	12.15
3	3	7.20	23.00	16.25
3½	3	7.20	36.20	22.70
3¾	3	7.20	56.80	32.80
4	3	7.20	94.40	51.20
4¼	3	7.20	179.20	116.40

Table VII

Average Cost of X-Ray Paper and Film

	Paper	Two Papers	Film
Per single exposure	$0.075	$ 0.15	$ 0.18
Per longitudinal seam	0.75	1.50	1.80
Per girth seam	1.70	2.40	2.90
Three longitudinal seams	2.25	4.50	5.40
Four girth seams	4.80	9.80	11.50
Four ¼th girth seams	1.70	2.40	2.90
Per complete vessel	6.00	12.00	16.90
Per code vessel	3.45	6.90	8.30

Table VIII

Total Final Cost of Inspection per Vessel

Plate Thickness, inches	Paper — Complete	Code	Paper Two Sheets — Complete	Code	Film — Complete	Code
½	$ 17.60	$ 11.60	$ 24.80	$ 15.75	$ 28.50	$ 16.50
1	23.10	15.60	30.60	20.00	34.00	20.50
2	23.10	15.60	32.00	20.90	34.00	20.50
3	29.00	19.70	38.50	25.45	39.90	24.50
3½	42.20	26.15	53.00	32.60	53.10	31.00
3¾	62.80	36.25	75.60	43.70	73.70	41.10
4	100.40	54.65	117.00	64.00	111.30	59.50
4¼	185.20	119.85	210.30	135.60	196.10	124.70

Properties of Rolled Plates Improved by Heat Treating

WITH installation of a continuous heat treating furnace in the mill tables midway between the main rolls and the straightening rolls, the Worth Steel Co., Claymont, Del., has effected a refinement in production of quality steel plates on one of its mills. All plates rolled on this mill now pass through the furnace in which they can be brought up to a uniform heat and delivered to the straightening rolls at the proper temperature to permit effective flattening.

This mill is devoted largely to production of light-gage plates from ¼-inch down to 10-gage, inclusive, and in widths up to 100 inches. In rolling these gages, it is well known that by the time the plates have gone through the last pass required to bring them down to gage, their temperature has been reduced to such a point that it is extremely difficult to iron out all the waviness and buckles in the straightening rolls.

Cold Work Stresses Relieved

Furthermore, in finishing light-gage plates at low temperatures, physical properties are affected, resulting in a reduction of ductility and an increase in hardness and tensile strength. By use of the new furnace, all plates may be brought up to the proper temperature to relieve all cold working stresses and restore them to a uniform high quality, both as to physical properties and flatness.

Effectiveness of this heat treatment is demonstrated by actual results from a number of plates rolled from the same melt from which tests were obtained both before and after treatment. In the as-rolled condition, tensile strength ranged from 56,600 to 64,500 pounds per square inch, while after heat treatment the range was from 55,500 to 57,000 pounds per square inch. Elongation was increased from 1 to 4 per cent, depending upon the finishing temperature.

These plates were rolled in accordance with standard mill practice with the usual variations in finishing temperatures and the resultant variations in physical properties shown by the preceding as-rolled tests. As a result of the heat treatment, however, it will be noted that this wide variation has been corrected and all plates brought to a uniform grade.

The furnace, designed and built by the company's engineers, is of the continuous type, 50 feet in length. Plates are carried through on alloy chains driven from the exit end and supported on alloy rollers spaced regularly throughout the furnace. The speed of this chain may be varied from a minimum of 20 to a maximum of 80 feet per minute.

The unit is oil fired with five burners in each side wall. These burners are controlled automatically by means of thermocouples installed through the roof so that a uniform temperature is maintained at all times. A continuous record of temperature is obtained by two recording pyrometers supplied by the Brown Instrument Co., Philadelphia.

Fans Distribute Heat

To insure an even distribution of heat through the furnace, two propeller-type, alloy fans are placed immediately under the arch and spaced approximately 17 feet from each end. These are driven by vertical motors supported above the furnace.

In addition to the recording pyrometers which provide a permanent record of temperature, the furnace is equipped with a special recording meter which provides a permanent record of the progress of every plate through the furnace. This meter, supplied by the Eaterline-Angus Co., Indianapolis, records the speed of the chain at all times and also the exact time each plate enters and leaves. This record is obtained by use of photoelectric relays located at each end of the furnace.

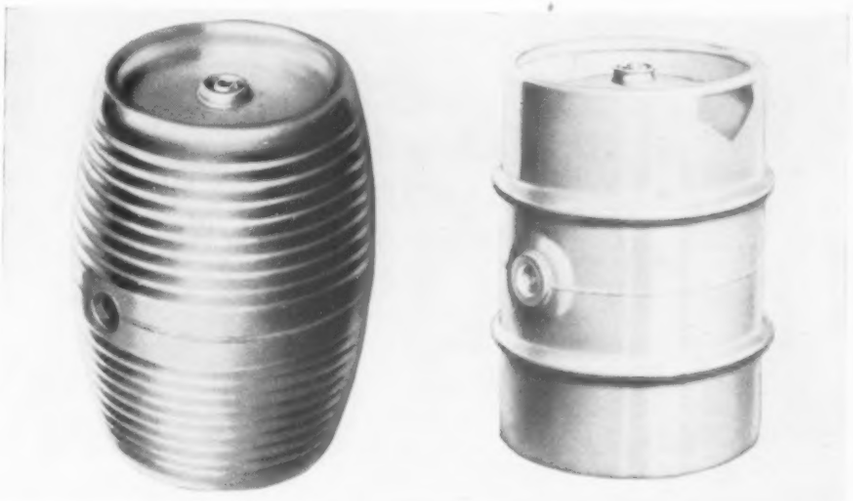
With the flexibility of control which is provided, both for temperature and speed of travel, it is possible to set up a definite schedule for the proper heat treatment of various gages and grades of material produced on this mill, which insures a uniformity of physical properties and flatness hitherto impossible of attainment, and which should facilitate layout and fabrication of the plates by users.

Gives Pointers on Motor Inspection and Repair

Improvement in business has stimulated interest in placing idle equipment in running order, and as a guide to the reconditioning of motors and generators idle for some time the Reliance Electric & Engineering Co., Cleveland, has circulated a recommendation sheet outlining tests, cleaning methods, inspection and procedure, etc. The information has been compiled by A. W. Ray, service manager of the Reliance company.

Recommends Course in Foundry Practice

The joint committee on foundry education in engineering schools, sponsored by the American Foundrymen's association, recently has published in mimeographed form the recommended course in foundry



NEW DESIGNS IN CONTAINERS FOR 3.2: Constant capacity, uniform weight, seamless construction assuring complete draining, easy cleaning and sterilization are advantages claimed for these new steel beer barrels, fabricated by Pressed Steel Tank Co., Milwaukee, and known as the "Hackney" barrels. Both the insulated bilge type (left) and the straight-side type (right) are manufactured, the former having a double wall construction while the latter is equipped with extra combination rolling hoop and footring. Linings or coatings can be of the type to suit individual requirements. Owner's name may be permanently embossed on the outside. Tap bush and bung are standard arrangement

practice for engineering schools. This course was prepared with the idea of strengthening courses in foundry practice already being administered in engineering colleges and universities and is arranged to give engineering students the type of information and knowledge of value in the design and use of castings.

The report was prepared by a subcommittee under the chairmanship of C. H. Casberg, University of Illinois, Urbana, Ill. Frank G. Steinebach, *The Foundry*, Cleveland, is chairman of the joint committee.

Cap of Peary Monument Made of 18-8 Steel To Withstand Arctic Exposure

CAPPING the 71-foot Peary memorial monument erected on Cape York at the northern tip of Greenland, is a hood of 18-8 chrome-nickel steel, designed to withstand the rigors of the Northland weather for many years to come.

Shaped like a pyramid and weighing 1000 pounds, the hood was fabricated and electrically welded by a patented process by Alloy Fabricators Inc., Newark, N. J. The piece, shown in the accompanying illustration, is 6 feet high at the tip, with each leg of its triangular base 9 feet long. The entire outer surface was ground and polished to provide added resistance to the elements.

Bolted to Monument

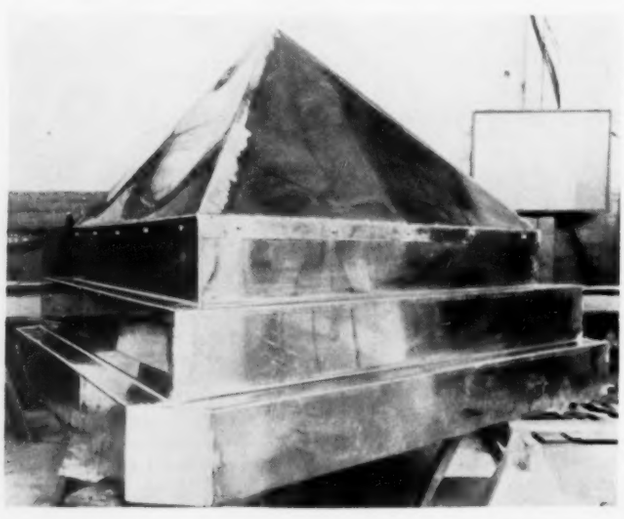
A single crate was used to transport the unit and, in view of the fact that it had to be crudely carried up the side of a cliff several hundred feet high, it was constructed accordingly. Anchor bolts ¾-inch in diameter and 24 inches long were used to secure the cap to the monument, which was constructed of stone. The bolts were made of stainless steel and were designed to eliminate the possibility of removal except through an entire dismantling process.

Erection of the monument was under supervision of Capt. Robert A. Bartlett, who headed the expedition to the Arctic this summer for the purpose and who was a friend of Admiral Peary and skipper of the ship he used on his successful hunt for the North pole in 1909.

18-8 Also Used on Ship

On this recent expedition, chromium-nickel steel also was used for the first time by Capt. Bartlett in connection with the engine exhaust stack. Four-inch IPS Carpenter tubing, this steel was used in three parts, consisting of a tee branch which connected on to the diesel engine, a short coupling and a tail piece, all connected with rubber hose.

This combination, it is said, has proved to be exceptionally good for handling wet gases, an objection, of course, being the tendency of rubber to disintegrate by aging. Some marine authorities believe that the ideal installation would consist of fairly light gage 18-8 tubing, installed in one or more pieces and bent to conform to the many obstructions encountered on board ship. However, to avoid a possible difficulty in making the complicated bends required on his schooner, the EFFIE M. MORRISSEY, Capt. Bartlett used the combination of the two, and also used an exceptionally heavy-wall tube to preclude any possibility of failure on a long trip of this character.



PIERCING the arctic winds of northern Greenland, this pyramid cap, of 18-8 chrome-nickel steel, will surmount a 71-foot monument, erected in memory of Admiral Peary, arctic explorer

Iron and Steel Engineers Will Meet in October

The Association of Iron and Steel Electrical Engineers has selected Pittsburgh as the place for its annual convention and iron and steel exposition to be held Oct. 17-19. Headquarters for both the meetings and show will be at the William Penn hotel. In recent years the organization has convened in June.

Simultaneous technical session will be held by the five divisions—mechanical, lubrication, combustion, electrical and safety. One of the features of the meeting will be the announcement of the winner of the association's campaign for "new uses for steel," which has been under way since last November. Originally the campaign was to end May 15, but with a later date being chosen for the convention, the contest was extended to Sept. 15.

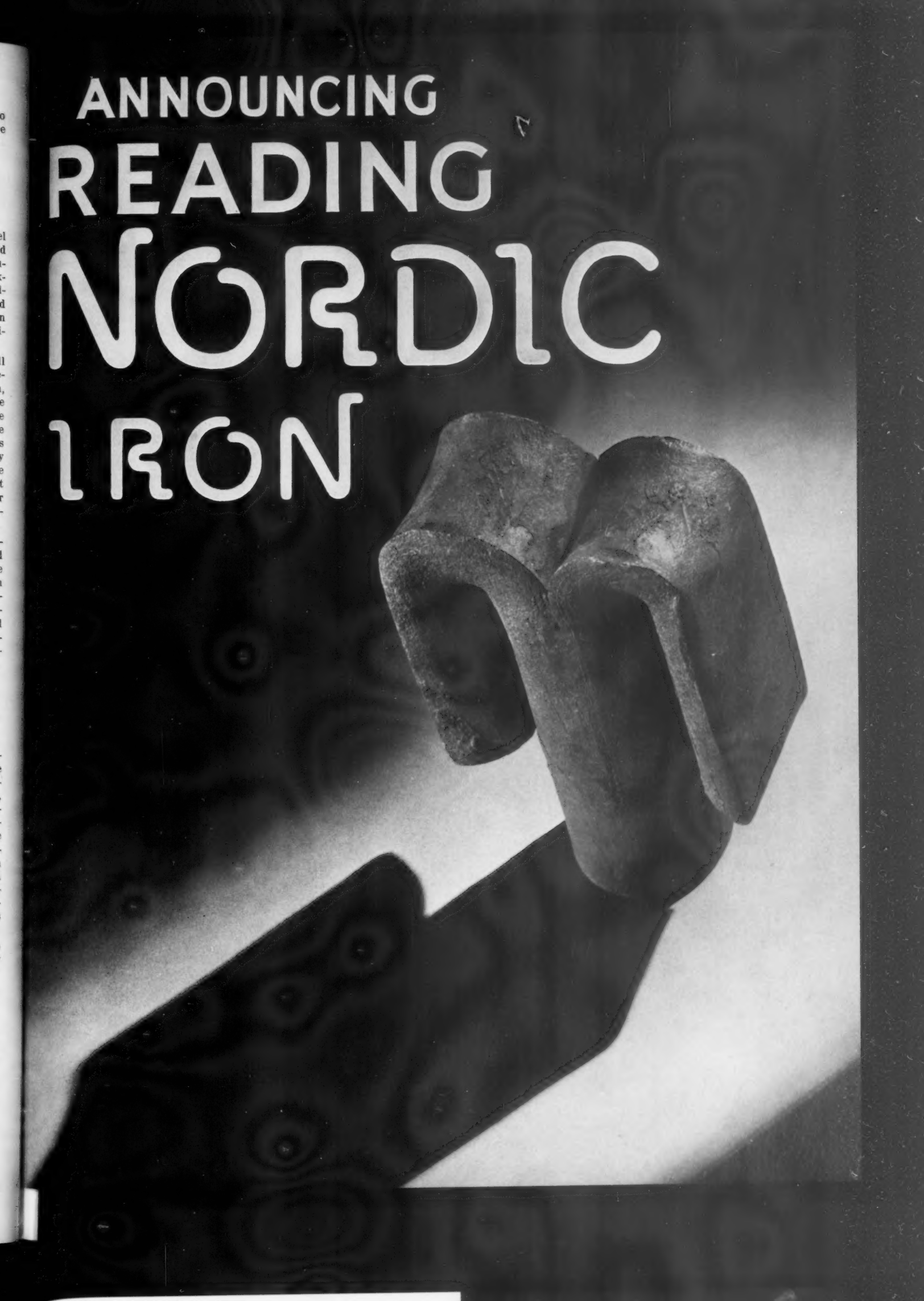
It is estimated that general adoption of suggestions already received would result in an increase in the use of steel amounting to more than a million tons. Adoption of one suggestion alone, that of building rolling mill housings of laminated steel plates, would mean at least an additional 150,000 tons of steel annually.

Handbook Supplies Full Data on Welded Tubing

A handbook of electric weld tubing, constituting what is said to be the first really serious attempt to establish standards for this industry, is available for distribution upon request to Steel & Tubes Inc., Cleveland, which company compiled the material. The 68-page book is replete with descriptive information on steel tubing, including forming and welding methods, physical tests, materials used, types and finishes, information necessary for ordering, lists of sizes and gages, list prices and extras, tolerances, special shapes, special alloys, information on bending, etc.

Announces Rust Remover

Rust Prevention Chemical Co., 1008 House building, Pittsburgh, is announcing a liquid preparation for application to rusted surfaces to reduce the rust chemically, to prevent further oxidation and to act as a binder between the metal and any subsequent application of paint. The compound, trade-name De-Rust-O, is slightly heavier than water.


ANNOUNCING
READING
NORDIC
IRON

NORDIC I

The Reading Iron Company announces the development of a special grade of bar iron which is recommended for service where extremely severe vibration is encountered. Mechanical service entirely free from the vibration which sets up alternating stresses and results in that form of failure known as metal "fatigue", is extremely unusual, not to say rare.

The structure of Nordic Iron is shown by the fracture which has a characteristically fibrous appearance. This "fibre" in wrought iron is due to the presence of many thousands of "threads" of slag, uniformly distributed throughout each square inch of cross-sectional area of the material.

By virtue of this unique structure, a bar of Nordic Iron reacts to vibrational stresses like a closely knit bundle of individual wires, rather than a solid bar, and for this reason possesses a very high resistance to failure due to vibration or fatigue.

Another important and valuable characteristic of this Nordic Iron is its resistance to impact or shock resulting from a sudden blow or a suddenly applied load. Stresses of this type are of frequent occurrence in some kinds of service and it is well established, by the experience of those who have to maintain equipment subjected to vibration and shock, that a "tough" wrought iron will outlast other materials possessing much higher tensile properties as determined by laboratory tests.

IRON

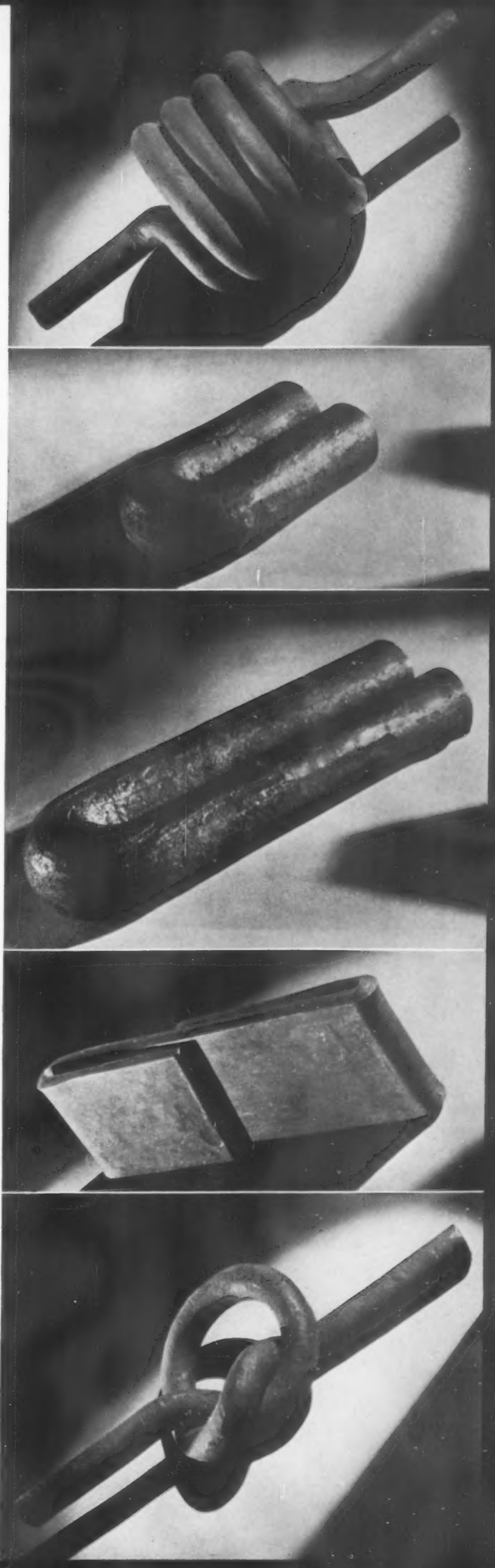
There is probably no service where vibration and shock play a more important part in causing failures of structural parts than railroads, particularly the electric street railways. Bars which are used as hangers, brake rods, truck bolts, clevises, equalizers, spring bands and many other important parts are constantly subjected to the most severe punishment and must resist day after day these extremely severe physical stresses as well as corrosion.

Coal mine equipment, where safety is of prime importance, such as the door latches, top door bars, center hitching hooks, and side pulling hooks of mine cars, all round chain links, jig irons for breakers, and swivels and links on mine cage chains, is another service for which this material is admirably suited.

Swedish iron has long enjoyed a deservedly high reputation for toughness and ductility which give reliability in service under the most severe conditions. Reading NORDIC IRON not only possesses the same degree of toughness and ductility as Swedish iron but, in addition, has a greater tensile strength and will be found to be equal or superior to the best of imported iron.

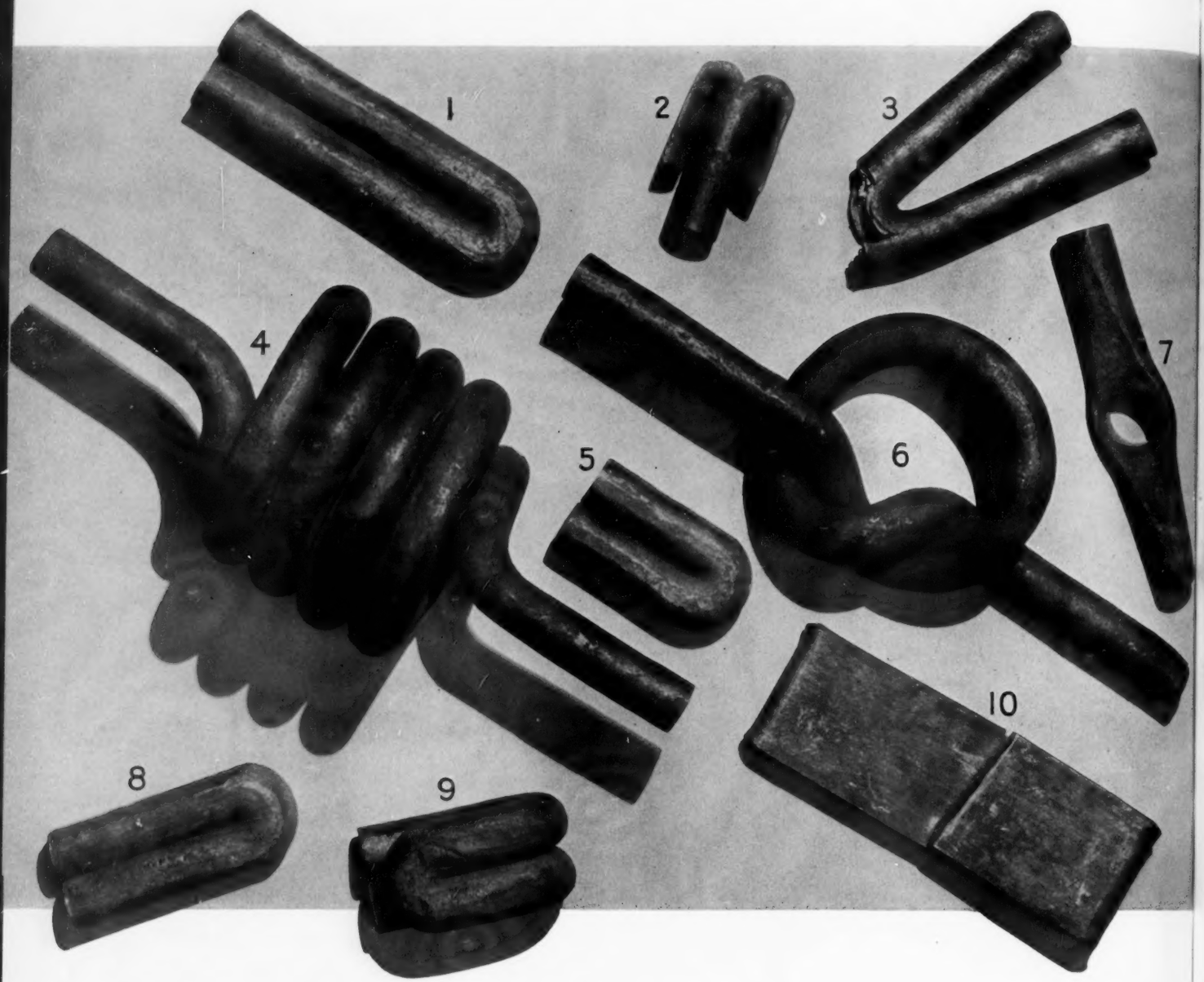
The chemical and physical properties of the Reading Nordic Iron exhibited a greater uniformity than the imported product when a comparative investigation was made. The average results of the tensile tests are shown below.

	Reading Nordic Iron	Imported Swedish Iron
Ultimate Strength (lbs./sq. in.)	48,930	44,250
Yield Point (lbs./sq. in.)	30,120	30,160
% Elongation in 8"	34.6	32.5
% Reduction of Area	62.7	63.8



Reading NORDIC IRON will bend cold or hot equally as well as Swedish iron and possesses the characteristic free welding qualities and ability to stand, without damage, temperatures several hundred degrees higher than can be employed in heating and welding the best steel bars.

Reading NORDIC IRON can be obtained in commercial sizes from our Montour department. Write us today for quotations.



1. Two pieces welded, then bent on weld.
2. Split Bend.
3. Nick Bend.
4. 1⅛" round coiled.
5. Hot Bend
6. Knot.
7. Drift Test.
8. Cold Bend.
9. Two pieces welded, bent on weld, then bent cold on opposite plane.
10. Flat bend in both directions.

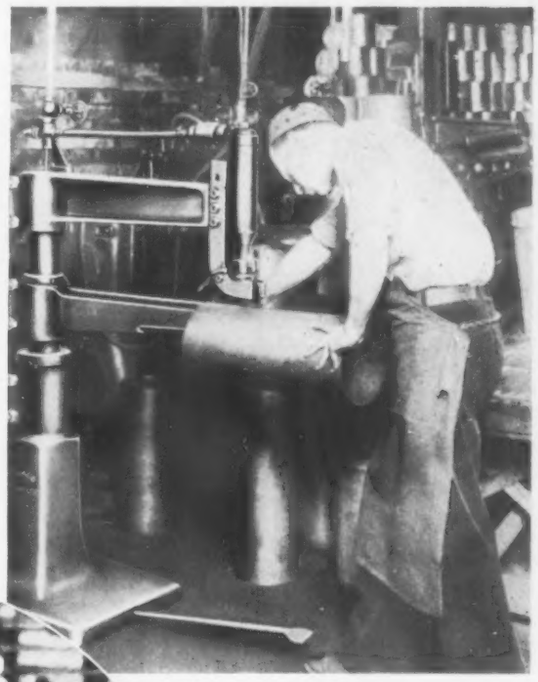
READING IRON COMPANY

401 NO. BROAD STREET, PHILADELPHIA

Riveters Are Made Lighter, Easier To Handle

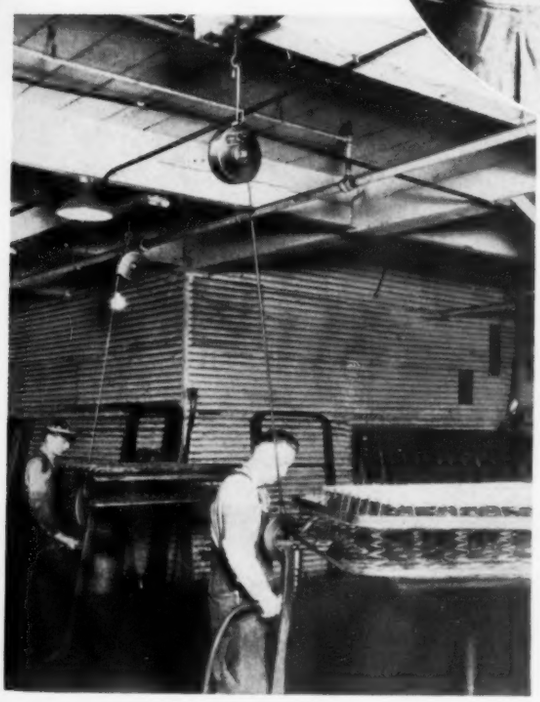
Illustrations are of riveting equipment built by Chicago Pneumatic Tool Co., New York

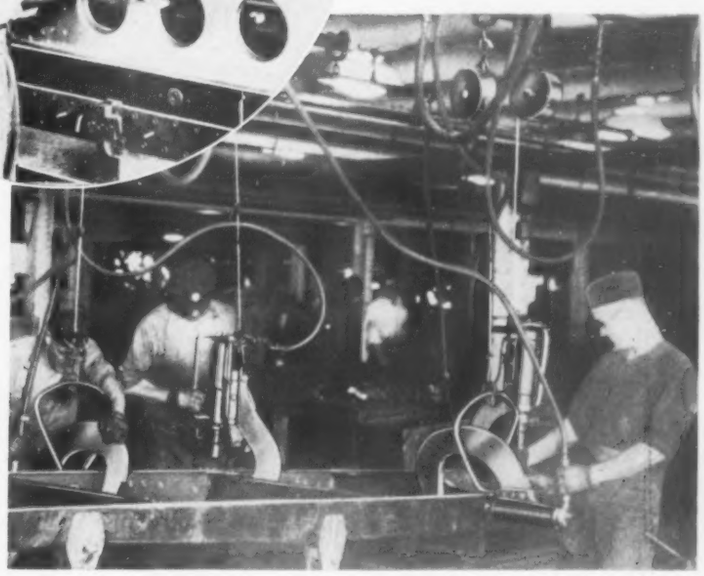
IN THE construction of lifeboats at the plant of the Welin Davit & Boat Corp., Newark, N. J., a yoke riveter is used on the keel joint, as shown below. The boats are formed of galvanized sheets, with edges overlapped. The riveter is swung on a chain to facilitate its manipulation



DURALUMIN and aluminum rivets must be squeezed, not hammered. This is done successfully by the use of a pneumatic squeeze riveter of the yoke type, shown in the illustration at the right. The unit is in use in an airplane manufacturing plant; it weighs only about 10 pounds

COMBINATION of riveting and welding is used in fabrication of milk cans, shown above. The cans, made by Buhl Stamping Co., Detroit, are formed from steel sheets, welded and the weld ridge smoothed down on a riveting hammer of the stationary yoke type equipped with a special lower arm





MOTOR truck manufacturers have replaced stationary compression riveters with portable yoke riveters suspended on movable balancers for riveting truck frames, as shown above. This simplifies working on the moving conveyor line. Relieving operator fatigue by suspending yoke riveters on overhead spring balancers is shown at the left, in the pant of a bed manufacturer, where steel springs are being riveted to spring frames

IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR.

Part V—Open-Hearth Furnace Lines

(Thirty-Fifth Article of Series)

FOR the purpose of demonstrating the value of the flow diagram and its analytical use, five furnaces have been selected as well illustrating certain features that are worthy of comment.

Any engineer skilled in a certain branch of technology should be able to criticise the data of that particular branch in detail. Complimentary criticism, if warranted, should be offered freely, but adverse criticism cannot ethically be offered if it is not accompanied by a suggested betterment. In the following discussion of certain furnace lines, criticism of both types is made and it is hoped that where the criticism is adverse, the suggested betterment may be of real service.

The furnaces diagrammed, listed in the order in which they are presented are:

Furnace B, Fig. 47: An oil-fired furnace, selected first on account of its fine fuel record and second, and more particularly, on account of its lines which develop the most nearly ideal conditions of gas velocity of any of the 16 furnaces described in this work.

Furnace I, Fig. 48: A furnace designed primarily for firing with producer gas but actually operated on oil fuel at 20 per cent above the capacity for which initially designed. Chosen for illustration on account of its excellent fuel record and gas velocity condition.

Furnace K, Fig. 49*: Has the best fuel record of the producer gas fired units with excellent lines for this type of firing.

Furnace O, Fig. 50*: Another producer gas fired furnace, included as an example of excessive forcing to produce high tonnage rates.

Furnace G, Fig. 51*: Included on account of the unusual method of firing, its fine fuel rate and as a particularly good example of how adverse features of design are indicated clearly by the use of the diagramatic method.

Involves No Difficulty

With the proper data at hand the construction of a flow diagram for any furnace is accomplished easily, as follows: A vertical line is erected which is to represent the transverse center line of the bath and a horizontal base line is drawn. Vertical lines to locate the critical areas, A_1, A_2, A_3, etc., are drawn in their proper lineal relation at each side of the center line and to each other. Convenience rather than importance will govern the lineal scale used, the scale being simply laid off in "feet." The lineal location of the critical areas as well as the total inner length of the furnace are taken from Fig. 43 and 45.

The vertical scale which is in "square feet" had best be relatively great, as the greater the scale the greater the exaggeration of the differences of area which is desirable. The areas are plotted above a base line rather than half on each side of a longitudinal center line to further accentuate the differences.

The critical areas are as given in

*Figs. 49 to 51, inclusive, will be presented in subsequent issues.

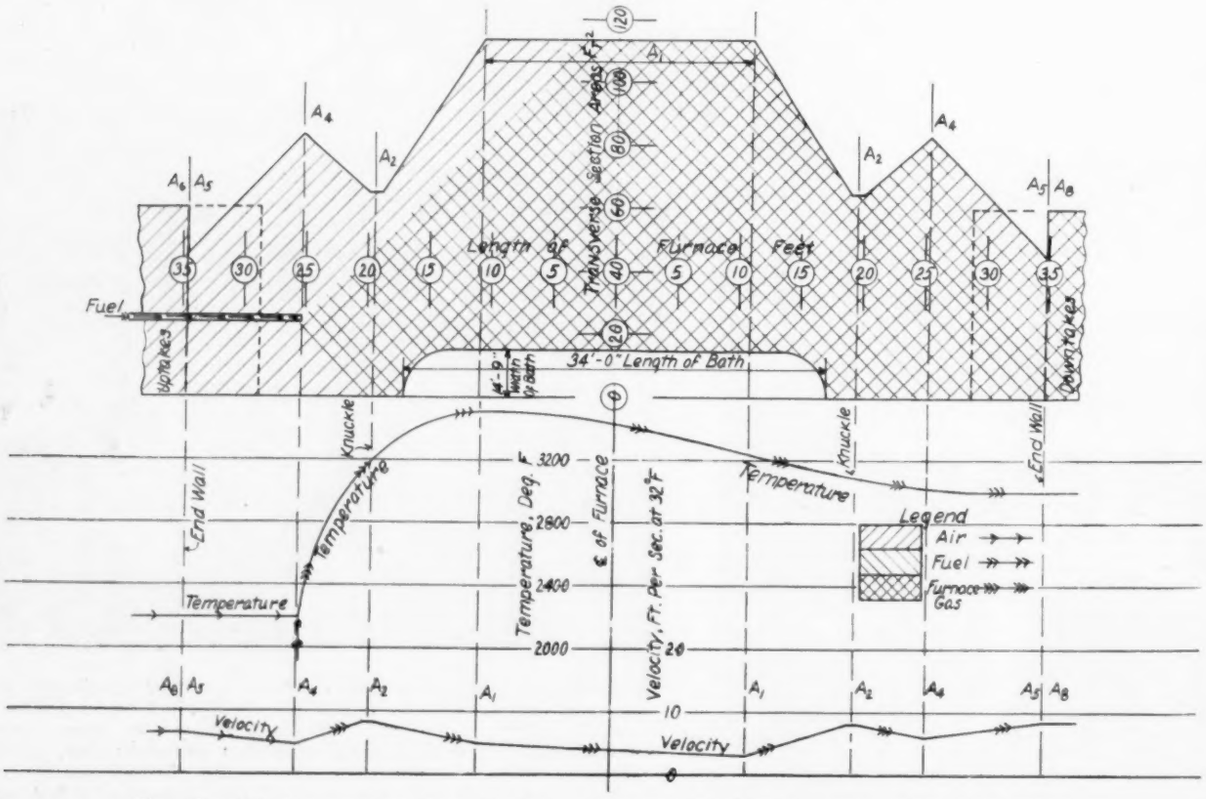
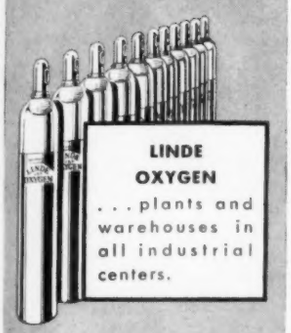


Fig. 47—Area-temperature flow diagram of furnace B which has an excellent fuel record

EVERYTHING FOR
OXY-ACETYLENE
WELDING & CUTTING



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Bronze-Welding Increases Return on Maintenance Dollars

Power Plant Saves Dismantling

In a hydro-electric plant, ice broke out sections of the vanes of a turbine. Replacement, including dismantling, was estimated at $900. Repair by bronze-welding was done without dismantling and cost only $225. The unit was out of service less than 25 per cent of the time required for installation of new vanes. Case No. 3154**

Bronze-Welding Prevents a Shutdown

A sugar refinery depended on a single steam engine for primary power. The frame yoke cracked through the flange from the bottom upward along both sides and extending around two-thirds of the circumference. Replacement cost was $1,600 for a new yoke plus $900 for installation. A service operator advised bronze-welding without dismantling. Two welders, working simultaneously, completed the job in 8 hours. A shutdown was avoided. Case No. 2978**

Frame Bronze-Welded in Place

A brick-press frame developed a 36-in. fracture through 1¼-in. cast iron. Replacement would involve a special casting at $1000, delivery in three weeks. A service operator recommended repair by bronze-welding in place. The job was completed in four hours. The frame was then better able to withstand shock because the bronze weld metal was stronger and more elastic than the original casting. Case No. 4086**

Reciprocating Parts Rebuilt

A company operating a number of compressors, uses bronze-welding for maintaining efficiency. Thirty compressor cylinders have been resurfaced with bronze with an estimated saving of several thousands of dollars . . . . A marine company rebuilt four pistons by bronze-welding at a cost of $75 including machining. New pistons would have cost $350 . . . . Cost figures in a plant using bronze-welding for several years reveal an average cost of $20—including machining—for rebuilding pistons, against $45 for new pistons. Case No. 5273**

City Saves $1800

A 36-in. valve improperly installed in a city water main, cracked across the bonnet. The fracture extended 18 inches into the valve body. Bronze-welding the crack in place cost less than $200 and saved $1800 on replacement cost. Case No. 2701**

$2000 Casting Saved for $200

In a Middle Western plant, after $2000 had been spent in the manufacture of a pump casting a large bearing section was broken off. It was restored to full strength and alignment by bronze-welding for less than $200. The only preheating necessary was done with the blowpipe. Case No. 4195**

Oxweld No. 25 M. Bronze Rod

Increasing use of oxy-acetylene welding with bronze led to the development of Oxweld No. 25 M. Bronze Rod. This rod melts rapidly, flows freely, tins easily and solidifies quickly, combining speed with ease of application. It produces welds in steel plate with tensile strengths and ductility about 40 per cent higher than welds made with conventional bronze rods under similar conditions and the strength in shear is even greater. The hardness of welds made with this rod (96 Brinell) makes it especially useful for building up wearing surfaces. The weld metal can be remelted, permitting the same wearing surface to be rebuilt. A complete description of Oxweld No. 25 M. Bronze and other important Oxweld welding rods and fluxes is available in a new booklet, *Oxweld Welding Rod*, now available from any Linde District Office.†

New Literature

The Progress of Bronze-Welding and *The Principles of Bronze-Welding* fully explain correct practices for the application of bronze-welding and the great value of the process as a construction and repair method. These booklets are now available from any Linde District Office.†

**These typical savings may suggest a more aggressive use of bronze-welding in your plant. If you want additional details on these or other money saving applications of Oxwelding refer case numbers to the nearest Linde District Office.

†Copies on request. No obligation.

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Table LIII and the figures of area are located appropriately to the vertical scale and connected by straight lines as shown. The areas enclosed in dotted lines at each furnace ends are the the uptake or downtake areas in proper relation to the furnace length. The entrance of the fuel and its location of entry into the air stream is indicated.

Conditions Are Duplicated

From the chart it will be seen that the fluids entering the furnace usually and correctly first expand, then contract at the knuckle, expand to a greater degree over the bath, contract again at the outgoing knuckle and again expand before finally contracting to enter the downtakes.

If actual temperature readings from a furnace are available and sufficiently complete, the temperature curve is laid in from such data; but if absent, as will usually be the case, hypothetical figures such as in Table LVII are convenient.

The fluid velocities having been developed either from actual test data or in accordance with the methods previously described to values similar to those as computed in Table LXI are located correctly with reference to the critical areas, and are connected by lines as indicated, thus completing the graph.

The study, developed as described, presupposes that at all times the flowing gaseous fluids expand to fill the immediate volume that contains them and that stream lining or turbulence of gases entirely is absent.

Unless excessive superatmospheric pressure is developed at some point in the system this supposition is incorrect at least so far as the incoming end of the furnace is concerned, for it is the differences of velocity and direction of the several fluids that produce the turbulence necessary for the intimate and rapid mixing of the air and fuel in combustion. However, procedure on the assumption of a value of the mean velocity of the fluid passing through a given transverse area is an entirely proper basis for comparison. A nearly mean flow value should actually be accomplished on the outgoing end from the knuckle onward.

As the furnace gases reach their maximum temperature and volume after passing the incoming knuckle and more nearly flow at the calculated mean velocities, the outgoing end of the furnace offers the best location for a study of lines and flow effects.

Effects Are Studied

Consider the diagram, Fig. 47. The air flowing in the uptakes, A_6, to the throat has an equivalent velocity of 6.7 feet per second, and this decreases at A_1 the point at which it meets the fuel, to 4.8 feet per second.

From Fig. 46 it may be found that these velocities represent less than 0.01-inch water pressure.

At A_2 the average velocity of the furnace gas is but about 8 feet per second dropping when the maximum area over the bath is reached to less than 5 feet increasing to 8 feet at the outgoing knuckle, dropping to about 6 feet at A_4, and flowing into and continuing in the downtakes at not more than 8.5 feet per second. The equivalent pressure of this latter figure, which is the greatest found in the entire system, is but 0.015-inch water, a nominal figure.

Areas Are Omitted

The example under discussion and that next discussed offer fine examples of what may be accomplished by competent design, in the development of mean velocity flows by the omission of areas of considerable contraction that develop abnormal velocities which result in difficult and costly maintenance. The operation of this furnace including the upkeep cost should be satisfactory and if necessity arose, higher production rates likely could be accomplished without increase of operating and with but slight increase of upkeep costs.

One point in connection with the velocity flow of Fig. 47 is of minor import in this particular case but of general importance in case of operation and throat upkeep. The velocity at the outgoing area, A_2, is 8.0 feet per second, and in the downtakes at A_8 is 8.5 feet per second or slightly higher. The velocity of A_8 always should be less than at A_2 and the velocity between A_2 and A_8 always should be under that of A_2.

(To be Continued)

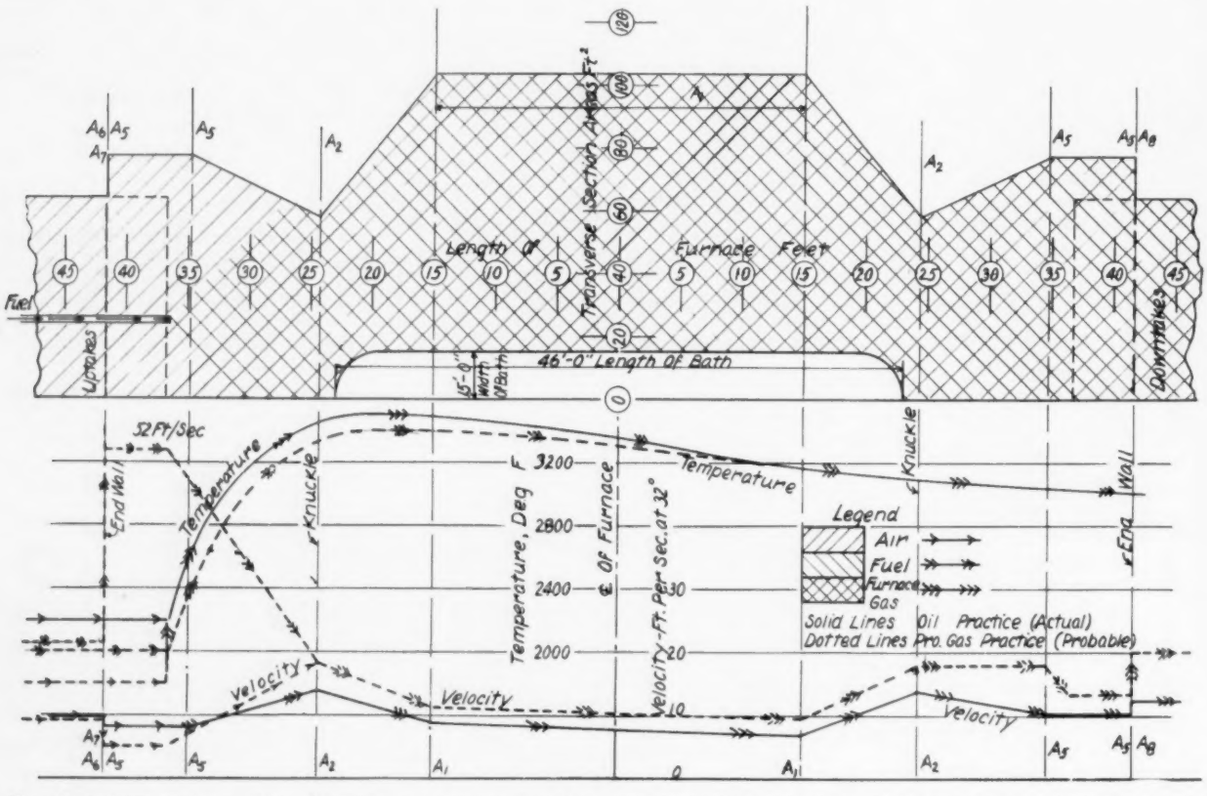
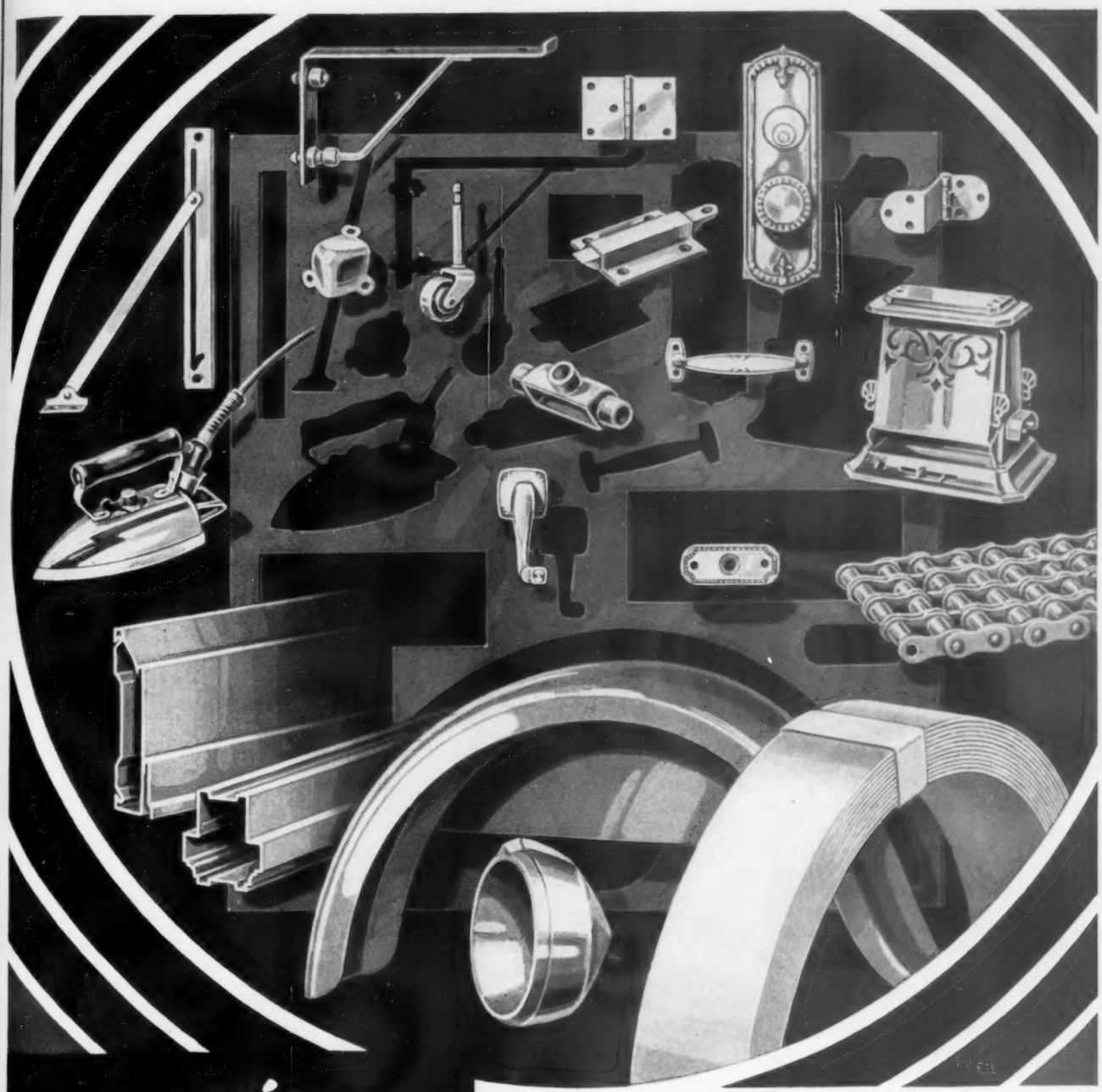


Fig. 48.—Area-temperature flow diagram of furnace I which operates at 20 per cent above the oil requirement for which it was designed



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Making the Most of

METHODS AND MATERIALS

THE trend in modern furnace equipment is to use protective atmosphere in the heating chamber. This atmosphere may be called upon to prevent oxidation of the material being heated, or in some cases to reduce the oxide already on the material. This atmosphere must be low in cost. One type of atmosphere producing equipment is an ammonia dissociator. The source of the gas is tanked anhydrous ammonia which is connected to a heat-resisting coiled tube containing a suitable catalyst. The coil tube is placed in an electrically heated chamber where the temperature is controlled automatically at the proper value. The ammonia gas is dissociated, giving a mixed gas containing 75 per cent hydrogen and 25 per cent nitrogen. This gas is produced at a cost of approximately $4.00 per thousand cubic feet, using ammonia purchased in cylinders, this including the cost of ammonia and electric energy. This gas is suitable as a protective atmosphere for practically all applications where hydrogen is suitable.

$ $ $

A number of steel spring manufacturers recently have adopted spring forming guides made of tungsten carbide. These guides formerly were made of high-speed steel or plain carbon steel. It has been found that the tungsten carbide guides resist abrasion for much longer periods.

$ $ $

STEEL beer barrels are coming into expanding use. Up to the present time, wooden barrels in general have had the preference, however, the greater weight and consequent higher cost of transportation of the wooden barrel as against that of steel is a factor favoring the steel container. In some quarters, it is believed a shortage of suitable wood will develop in the near future, a factor which would help steel materially. So far, little has been done in the use of steel and its alloys other than plain carbon steel barrels with their interior surfaces roughened or otherwise prepared so that they will take and hold a coat of pitch. It is likely that the more expensive corrosion-resistant metals will not come into use extensively until brewers know more about the future status of their industry.

$ $ $

Long service has been experienced by a midwestern forgings manufacturer from a car-type annealing furnace employing a specialized refractory material for only a small portion of the total lining. Silicon carbide refractory is used around the firing tunnels, the remainder of the installation

being made up of a less expensive variety of fire brick. In being able to meet successfully the severe refractory conditions encountered around the firing tunnels, use of this relatively small amount of special refractory has prevented frequent shutdowns.

$ $ $

A 6½-inch diameter crankshaft of a large diesel engine locomotive used by a logging company in the Northwest broke off between the flywheel and the first throw. To replace this shaft would have cost practically $2000, not to mention the loss in having the locomotive out of commission while the shaft was being delivered and installed. Upon advice of an oxyacetylene operator, repair was undertaken by welding. To allow sufficient material on the end of the shaft for machining purposes, it was decided to replace the broken end with a new 7-inch diameter section. A furnace was built up around the shaft and the section to be welded was heated thoroughly with two preheating burners and some charcoal. High test steel welding rod was used and the repair was a complete success. The whole job did not cost more than $100, yet it saved a $2000 replacement charge.

$ $ $

A process has been developed for making castings with a chromium-nickel or chromium exterior, and plain carbon steel or gray iron interior. It is said that in the manufacture of the castings the face of the mold is sprayed with water glass, and then powdered chromium-nickel or chromium is blown on. This is continued until a coating of the proper thickness is built up. The face is dried thoroughly and then the molten steel or gray iron poured in.

$ $ $

ONE corporation credits a reduction in eye accidents amounting to 75 per cent to the use of goggles. Another corporation reports spending in two years $7000 for goggles for 1400 employes, and in one year alone 54 pairs were completely smashed, 23 pairs were smeared entirely with molten metal, and 111 lenses were cracked by flying fragments. The saving in this one year was probably $50,000.

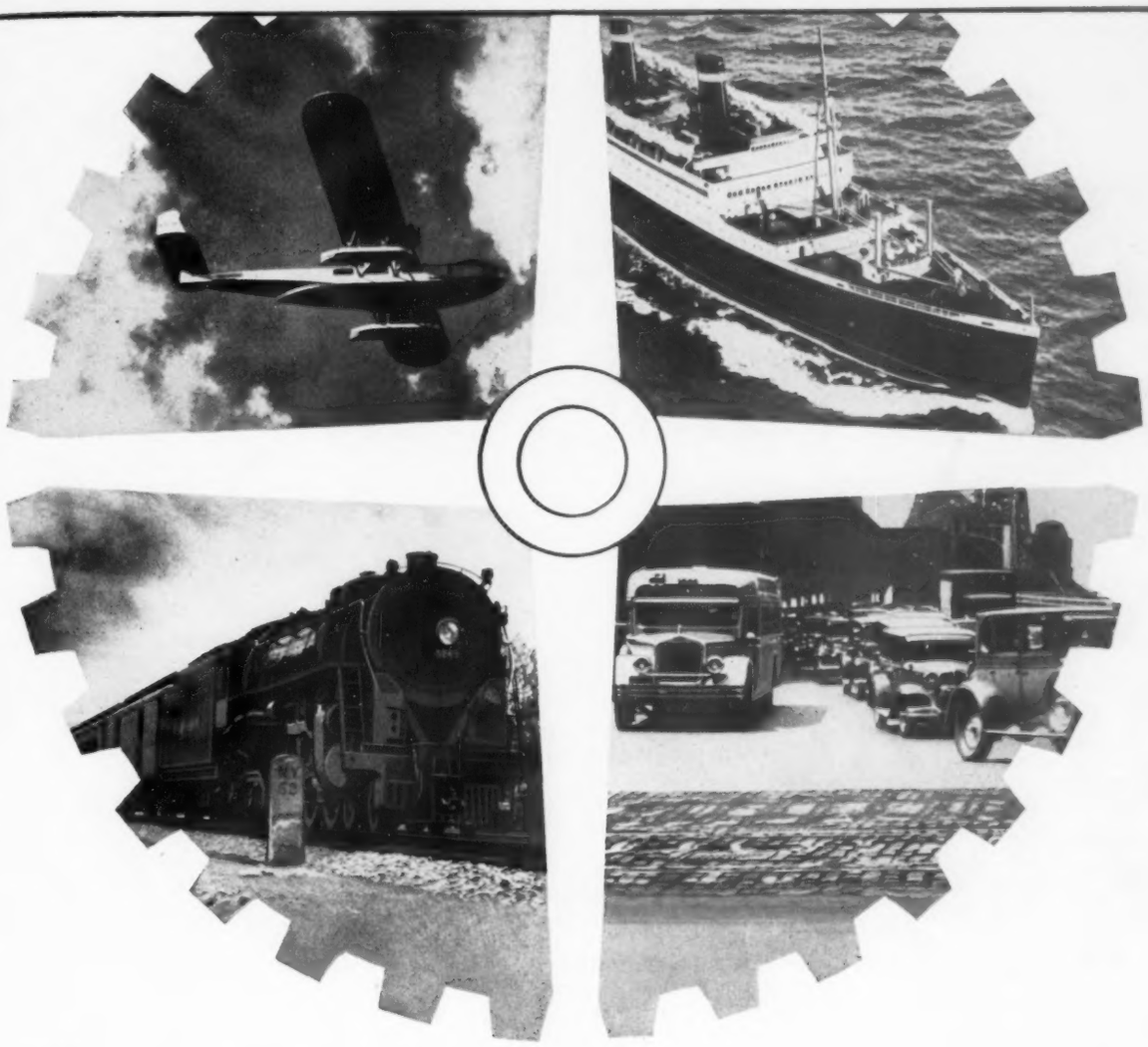
$ $ $

Instances of proper and improper design of zinc die castings for automatic buffing and polishing are innumerable. A projection from a plane surface, an irregular contour, an insistence on sharp edges where a rounded corner would serve just as well, may make polishing in an automatic or semiautomatic machine impossible and compel the use of hand polishing, sometimes at a cost 10 to 50 times as great.

$ $ $

A cast iron containing approximately 14 per cent nickel, 6 per cent copper and 2 per cent chromium, is finding usefulness in the following fields: Marine, automobile, oil refineries, pulp and paper, chemical, salt, sugar, food handling, canning and glass. It has been successfully used for engine pumps and manifolds, valve seats, heat control valves, heat-resisting iron, cyanide pots, centrifugal cast pump liners, gas lines, valves for corrosive liquids, filter parts and electrical resistance grids.

MODERN MACHINERY CALLS FOR MODERN METALS



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SWIFTER AND SWIFTER grows the tempo of modern transportation... demanding machines and materials that must stand greater stresses, greater shocks, greater heat, greater wear.

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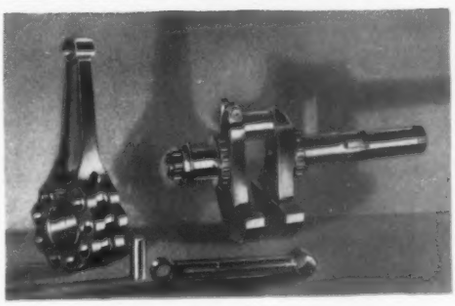
When Nickel is added to other metals in scientifically determined quantities, a wide range of improved properties results,—improvements that add longer life, reduce costs and make scores of new applications possible.



NICKEL ALLOY STEEL

Among the most widely used Nickel alloys are the Nickel Steels. Above is shown a typical crankshaft, master rod, link rod and pin made from Nickel Alloy Steel for use in one of the leading aircraft engines. These steels are specified for such highly stressed parts by practically all aircraft engine manufacturers both in America and Europe.

Not only in transportation but in every field where man uses metals, there is a commercial Nickel alloy that can be employed to fill some particular role more efficiently and more cheaply.

We have an extensive library of data on the uses of Nickel alloys, and will be glad to send you full information on any application. Our engineers have broad experience in the solution of problems involving the use of Nickel. You may feel free to consult them at any time regarding your specific requirements.

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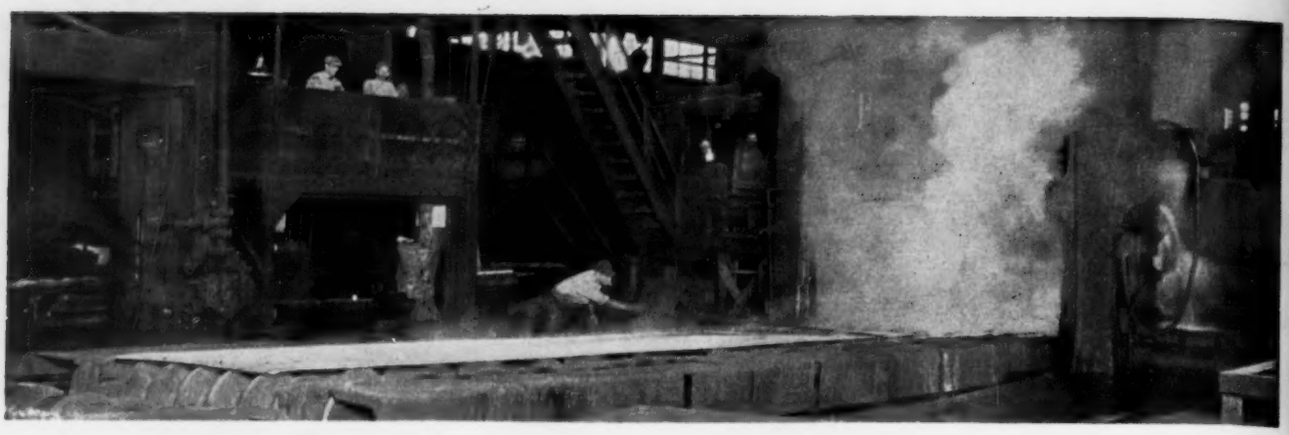
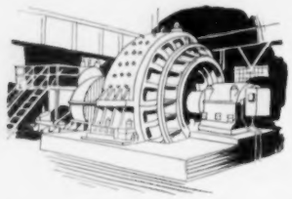


PROGRESS IN STEELMAKING

TITANIUM now is being added to 18-8 chrome-nickel steel for the purpose of stabilizing the metal. As a result of this development, the danger of intergranular corrosion is obviated. This type corrosion has been a serious factor in installations where heat treatment is impracticable after welding and where these steels are employed in applications involving high temperatures.



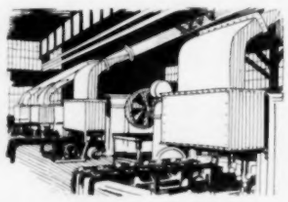
POWER tests disclose that alloy steel containing from 0.60 to 0.75 per cent carbon and from 0.50 to 0.70 per cent manganese requires nearly 33 1/3 per cent greater total energy to convert 3-inch slabs on a semicontinuous mill to 0.060-inch thick hot strip steel than does the same elongation of soft open-hearth steel.

♦ ♦ ♦

Galvanizers in Central Europe now are producing galvanized sheets devoid of an iron-zinc layer in the coating. The existence of an iron-zinc alloy layer, according to an authority on galvanizing practice, is the cause of brittleness of the entire zinc coating in bending. Precautions necessary to avoid the formation of the alloy layer start in the pickling operation. After the sheets have been pickled and washed they are immersed in a solution of diluted zinc chloride for the purpose of removing from the surface of the steel any salts of iron. Such iron salts are changed by the action of the molten zinc into metallic iron. Second, the pickled sheets before being introduced into the galvanizing bath, are heated for the purpose of freeing the iron from any hydrogen which may have been occluded by the iron during the pickling process. The third factor is that a certain amount of aluminum is added to the bath of zinc. Aluminum appears to have a greater affinity for iron than zinc and, therefore, is a help in keeping the coating free from an iron-zinc alloy layer. Employing the foregoing method affords a galvanized coating which after repeated bending will not break any sooner than the base metal.

♦ ♦ ♦

Pig iron with but few surface defects and with a small amount of chill now is possible to obtain simply by double skimming the molten metal as it flows between the ladle and the molds, by spraying the cooling water on the underside of the molds instead of directing the cooling medium on the pigs, and by thoroughly drying the molds before they return to the pouring station.



HEAT resisting and noncorrosive grades of aluminum paint have been introduced for coating the exterior of annealing and heat treating furnaces and iron and steel parts. The product is ready mixed in a synthetic resin vehicle which permits complete coverage with a thin mixture.

♦ ♦ ♦

Silicon carbide wheels are highly satisfactory for grinding steel mill rolls of chilled iron, according to an authority on abrasives. While the grit range is contingent largely upon the grade of steel to be rolled, yet for general work, wheels with a grit range of 24 to 36 are suitable for rough grinding and 60 to 70 for finishing and refinishing. Recommended wheel speeds are maintained with the exception that a reduction to 60 per cent of the rating for the final finishing passes will be found more efficient.

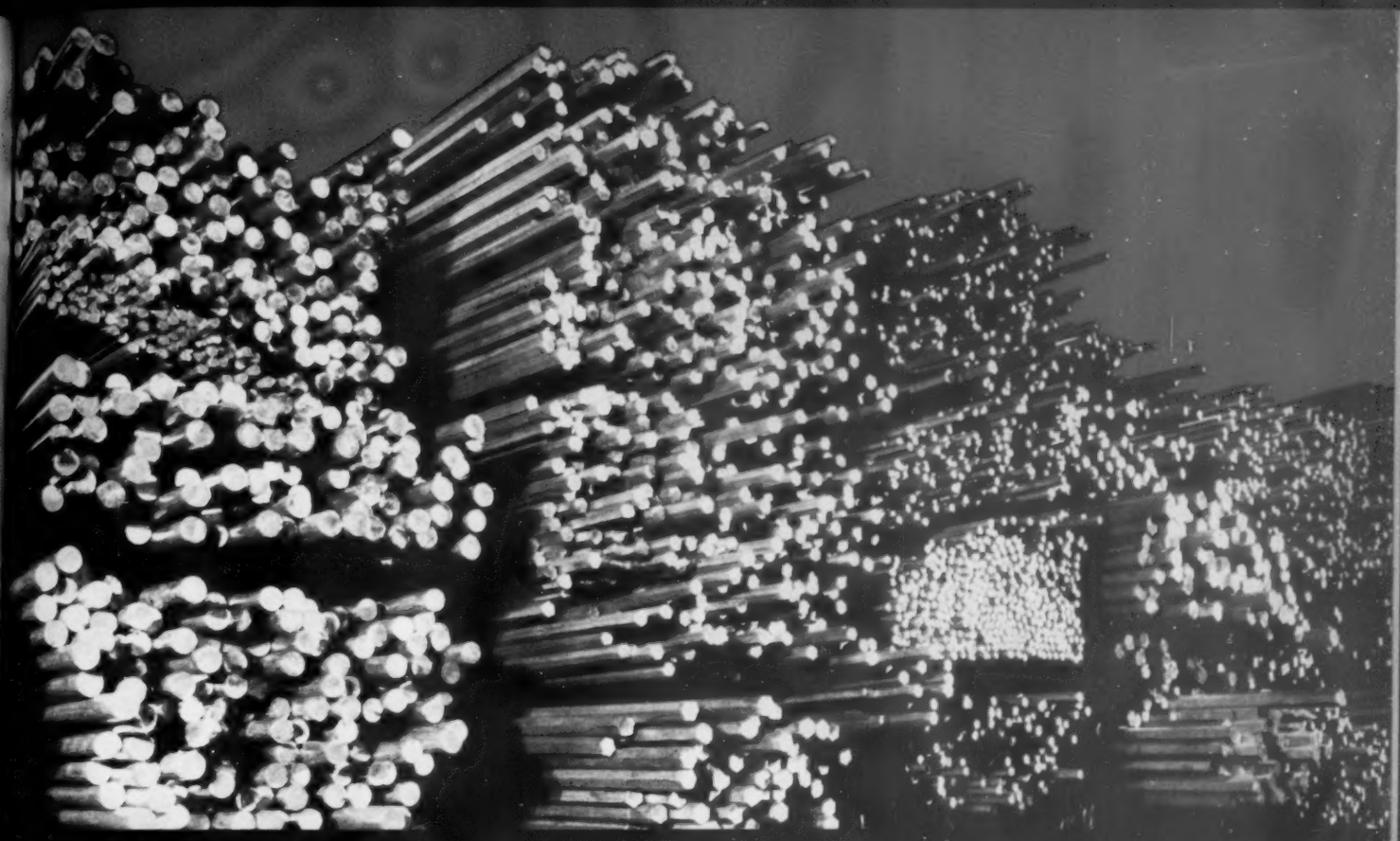
WELDERS at a Pennsylvania steel plant when not otherwise engaged are kept busy on a routine job of reclaiming water-cooled accessories such as blast furnace tuyeres, open-hearth and heating furnace doors and frames, buckstays and skewbacks, etc.

♦ ♦ ♦

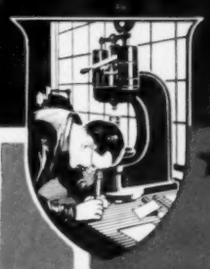
Magnesia cement used in the lining of a 4-ton induction furnace in a midwestern steel plant for melting high-quality stainless steels, has afforded a campaign of 76 consecutive heats, all poured at a temperature of 3150 degrees Fahr.

♦ ♦ ♦

Phosphorizing now is employed for imparting a chemical black finish to iron and steel surfaces. All grease is removed either by immersing the metal in a hot solution of potash or by electrolytic means. The steel then is rinsed in water, followed by an immersion in a hot solution of potassium phosphate and ferrous phosphate for the required time. The foregoing treatment imparts a dull black finish which is resistant to oxidation and serves as a protector of the base metal.



EFFICIENT PRODUCTION *of* SPECIAL SPECIFICATIONS



VIGILANT LABORATORY CONTROL

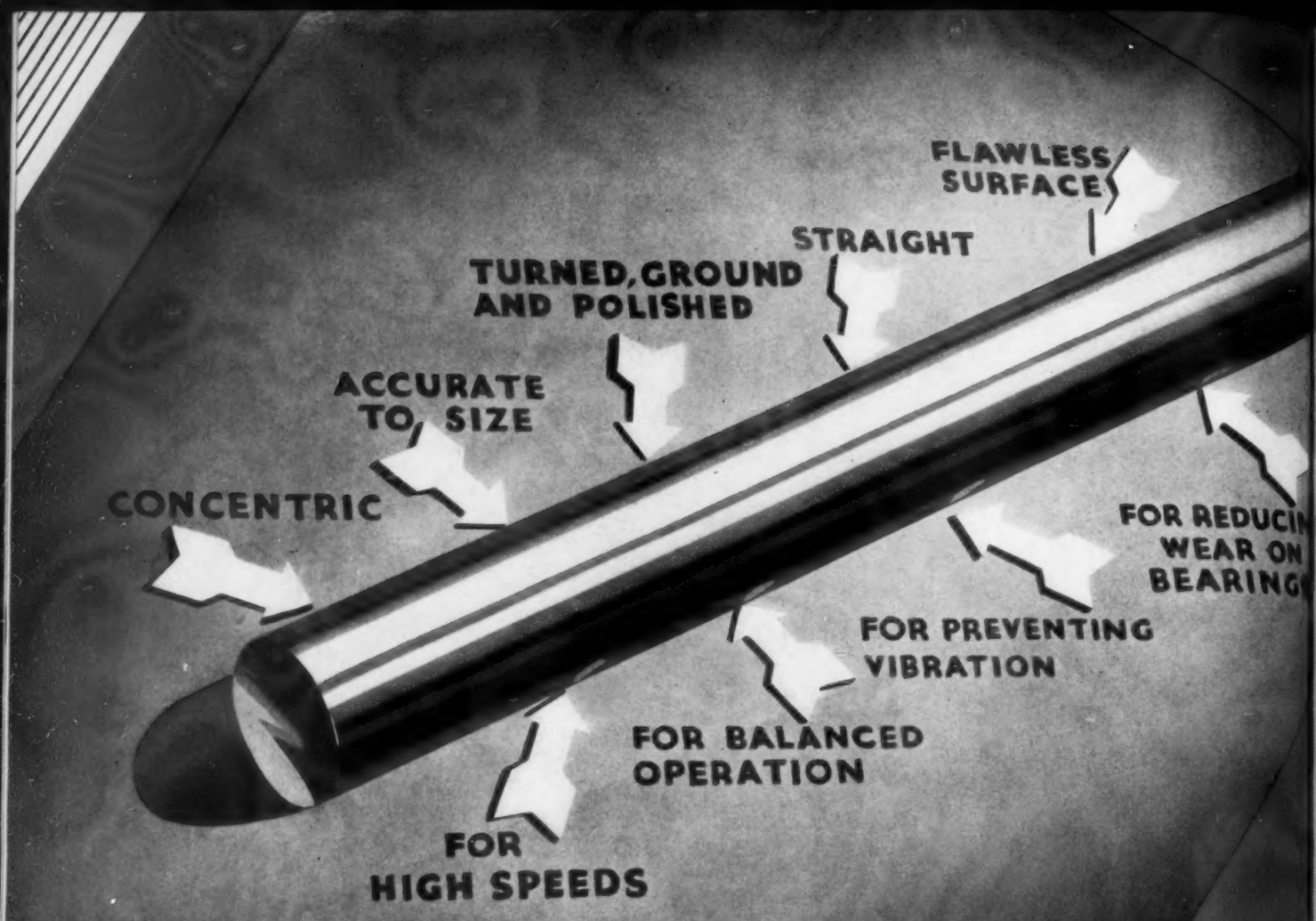
APPROXIMATELY seventy-five percent of the tonnage of Union Drawn Steels is made under specifications to suit individual requirements. Literally thousands of special specifications are filled each week.

Our organization and facilities are thoroughly developed to meet those conditions. Every order, large or small, is given individual attention at the laboratory. During production, each process is accurately controlled to furnish detailed requirements and results are carefully checked. Progress of production is systematically gauged to meet delivery schedules.

Union Drawn's efficiency in filling such a variety of needs is evidenced by our wide reputation for supplying specifications accurately and on time.

Cold Drawing Provides Maximum Machinability

UNION DRAWN STEEL CO.
MASSILLON, OHIO



UNION PRECISION SHAFTING

Inspected Over Every Inch of Length

SHAFTING is the heart of machinery, the units which govern all moving parts. Don't overlook their vital importance when seeking improvement for your product.

An ever increasing number of manufacturers find in Union Precision Shafting those superior qualities which promote greatest operating efficiency and economy. In machines of every design this masterpiece of steel bar production assures smooth, vibrationless, balanced operation with minimum wear on bearings.

The grinding and polishing of Union Precision Shafting is followed by exceedingly rigid inspection to make certain that extremes of accuracy have been met in concentricity, straightness and size. Every inch of surface is checked for the detection of flaws.

Furnished in all grades of carbon or alloy steels in sizes from $\frac{3}{4}$" to 8" inclusive.

UNION DRAWN STEEL CO. · · · MASSILLON, OHIO

UNION DRAWN STEELS

SCANNING THE FIELD OF TECHNOLOGY

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

Cutting Fluids

By Joseph Geschelin, in Automotive Industries, May 27, p. 638, 4 pp., 2 ills., 1 table.

In the present state of the art of metal cutting, a cutting fluid has three basic functions which, in varying degrees, are: Refrigeration or cooling; lubricity or oiliness; and fluidity, wetting out or penetration. Recent work recognizes an antiweld characteristic as a fourth function which may be desirable in varying degrees. The latter is the action of a lubricant in preventing the welding or pickup between the tool and the work. Because cutting fluids vary so widely due to differences in raw materials, methods of compounding, etc., fixed specifications are an obstacle to production economies, in the opinion of many experts.

—STEEL, 6-5-33

Temperature Coefficients

By G. H. Keulegan and M. R. Housman, in research paper No. 531, bureau of standards; supplied by superintendent of documents, Washington, for 5 cents.

A report describing work in the determination of the temperature coefficients of the modulus of rigidity and of Young's modulus of elasticity of 31 alloys and metals in the temperature range −50 to 50 degrees Cent. Materials were selected on the basis of their possible use as elastic elements for aircraft and other instruments.

—STEEL, 6-5-33

Railway Equipment

By M. W. Featonby, in Welding, May, 4½ pp., 11 ills., 2 tables.

Use of welding as applied to fabrication of railway equipment in the Newport shops of the Victorian railway, Melbourne, Australia. Welding has been found to offer advantages of decrease in weight and consequent decrease in nonrevenue load, and the possibility of adopting less expensive and more logical design. Practical examples of welded railroad assemblies are described, as are test results.

—STEEL, 6-5-33

Research

By L. W. Chubb, in a talk before the Engineering Society of Western Massachusetts, May 16, circulated by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., 14 pp.

The director of the Westinghouse research laboratories reveals how science explores industrial frontiers, continually looking to the development of new ideas to make living conditions more ideal. Threefold purpose of an industrial research laboratory is described, and practical examples of results achieved are cited.

—STEEL, 6-5-33

Iron-Cobalt-Tungsten

By B. A. Rogers, in Metals and Alloys, May, p. 69, 5 pp., 17 ills.

Investigation of the magnetic properties of a series of iron-cobalt-tungsten alloys. Alloys were heat treated and seven physical properties measured and compared: Coercive force; residual magnetism; flux density in a practically saturated field; density; electrical conductivity; hardness; and Young's modulus (dynamic value).

—STEEL, 6-5-33

Gate Valves

By H. J. Bartlett, in a paper presented at the April meeting of the Pittsburgh section of the American Welding society, published in Welding, May, p. 221, 7½ pp., 2 ills., 14 tables.

Effects of welding temperatures on steel gate valves are discussed, tests being cited to show that the heat increase at the seating surfaces of all welded valves is well below their rated temperature.

—STEEL, 6-5-33

Clean Story

Booklet published by the Hagan Corp., Pittsburgh, 20 pp.

A Clean Boiler Story is the title of this nontechnical discussion of the question of maintaining clean boilers, boiler water treatment etc., based on results obtained in a number of plants by use of the Hall system of water conditioning. A bibliography of over 50 technical papers on the subject is appended.

—STEEL, 6-5-33

Wire Rope

By A. J. Morgan, a paper presented at the second National Lubrication Engineering meeting at Pennsylvania State college, State College, Pa., May 25-26, preprinted, 2 pp.

Wire rope demands careful attention to its lubrication. It is necessary to determine the type of lubricant and the proper method of application, as well as the effect of this lubrication on the functioning of the rope in all of its component parts.

—STEEL, 6-5-33

Highway Bridge

By Ira D. S. Kelly, in Journal of the American Welding society, May, p. 18, 4 pp., 4 tables, detail drawings.

Important details of an arc-welded through truss steel highway bridge designed for a span of 140 feet and a roadway width of 24 feet are presented. Analysis of costs is included.

—STEEL, 6-5-33

Bearing Design

By T. W. Gordon, a paper presented at the second National Lubricating Engineering meeting at Pennsylvania State college, State College, Pa., May 25-26, preprinted, 2 pp.

Some practical factors affecting the design and operation of bearings for large rotating apparatus.

—STEEL, 6-5-33

Die Castings

By Edgar Parkinson and Frank V. Faulhaber, in the Iron Age, May 18, p. 783, 1½ pp.

Successful finishing of die castings is described, with special attention devoted to details preparatory to application of the finish. Pertinent, technical suggestions and pointers for processing this work are included.

—STEEL, 6-5-33

Early Blast Furnaces

By L. W. Spring and L. E. Gilmore, in Metals and Alloys, May, p. 65, 3 pp., 3 ills.

Third article in a series dealing with early chemistry and chemists in the iron and steel industries. Scenes around the early blast furnaces are described, principally by means of a letter from an old-time blast furnace chemist.

—STEEL, 6-5-33

Farm Machinery

By Francis A. Westbrook, in Welding, May, p. 205, 2 pp., 3 ills.

Proper application of hard facing material to farm machinery is demonstrated to prolong the life of the equipment and reduce maintenance costs. Suggestions are offered for hard facing such implements as plow shares, harrow teeth, plow and harrow disks, thresher teeth, hay hammers, tractor parts, mower shoes, etc.

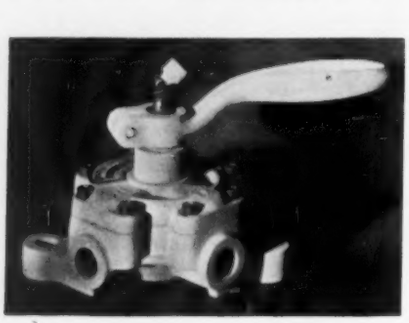
—STEEL, 6-5-33

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Packless Construction Is Feature of New Valve

Hanna Engineering Works, 1765 Elston avenue, Chicago, recently designed a valve in which the disk seats upon the bonnet. Both the disk and bonnet may be reground without removing the valve body from the pipe line or disturbing pipe connection or valve mountings. Renewals can be made easily by simply removing the socket head cap screws. Between reversals, disks rotate on two eccentric points while in contact with the seats.



Hanna Unitite valve in which the disk seats on the bonnet

The unit, shown herewith, is a packless valve suitable for air, oil or water at pressures up to 250 pounds per square inch. Both disk and stem are lubricated by an oil well in the stem. The valve is universal in its application and may be used as a straightway, 3-way or 4-way valve. Balanced disk pressure throughout the contact area is attained by the arrangement of seat ports and disk pockets.

◆

System Provides Industrial Gas Furnace Control

Pittsburgh Equitable Meter Co., 398 North Lexington avenue, Pittsburgh, has developed a new unit for industrial gas furnaces, which performs in a single installation the functions of burner pressure control, flow indication and volume measurement. This unit consists of a combination of a remote controlled pressure regulator and single pen indicating orifice meter equipped with square root chart. Through a pressure tap directly to the burner manifold, the regulator maintains a constant pressure at the manifold, regardless of the number of burners in operation.

The simplified orifice meter is provided with an indicating scale, over which the pen arm describes an arc and indicates the rate of flow expressed in cubic feet per hour. The operator, by glancing at the scale can determine instantly the amount of gas being used by the furnace at any time.

◆

Industrial Locomotive Is Diesel Powered

Whitcomb Locomotive Co., Rochelle, Ill., has developed a new series of diesel-powered, mechanical transmission drive locomotives incorporating a solid injection power plant. The unit has a total weight of 16,000 pounds distributed over four drivers, and will handle a trailing load of 277 tons on a level track. Hourly fuel consumption is less than two gallons with the diesel engine operating at a fifty per cent load factor which is seldom exceeded in actual service. The engine is equipped with an electric starter and the control system has been simplified to eliminate any possible confusion on the part of the operator.

◆

Designs Multicut Pack Shear For High Production

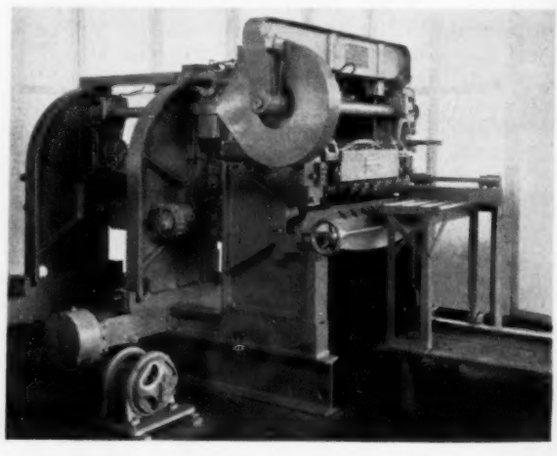
Streine Tool & Mfg. Co., New Bremen, O., recently developed a new multicut pack shear designed primarily to shear packs of tin plate as they come from the hot mill, tack plate and similar products into uniform accurately squared multiples. Production per eight hour turn will average 50 gross tons.

The outstanding feature contributing to successful performance of this unit, shown herewith, is a patented tension roller conveyor. The conveyor continues to run at all times and while a multiple is being sheared the tension rollers pass over the material and draw the pack immediately and accurately against stationary squaring edges. The shear is designed throughout with extreme simplicity and is constructed sufficiently sturdy in every detail to stand up under continuous high production mill operation. Design also facilitates rapid adjustment throughout the entire range of tin mill sizes.

◆

Offers Drum-Type Milling and Center Drilling Unit

Consolidated Machine Tool Corp. of America, Newton division, Rochester, N. Y., is offering a new drum-type milling and center drilling machine designed for rapid production of cast brackets and similar castings requiring facing and center drilling on both ends, pump shafts, propeller shafts, etc. The unit is continuous in operation and requires only unloading and loading by the operator at one station. Clamps holding the work in place on the drum are tightened automatically as the drum revolves; after the work passes the cutters and center drills, the clamps are loosened automatically. The machine is equipped regularly with six spindles consisting of two roughing and two finishing spindles for milling and two auxiliary spindles for drilling.



FRONT view of multicut pack shear developed by Streine Tool & Mfg. Co. to shear packs of tin plate as they come from the hot mill. This unit is designed to cut pattern sheets from the pack to uniformly accurate sizes. Rapid adjustment throughout the entire range of tin mill sizes is a feature

Steel Rate at 47; Big Gain in Pig Iron Output

Steelworks Pass 1931 Line on Way Up—Active Blast Furnaces Increase 27 Per Cent—Railroad Orders Heavier—Prospects for Strong Summer

BREAKING through the 1931 trend line, steelworks operations last week pushed up 4 points to 47 per cent, which considering the fact that some capacity is always out for repairs is equivalent to 50 per cent of practical capacity.

The unparalleled expansion in steel production in May, from 33 per cent at the beginning of the month to 47 per cent in the first week of June, is substantiated by an extraordinary rise in pig iron production for May. Daily output increased 40.7 per cent to 29,249 gross tons, and the total, 906,725 tons, was the highest since March, 1932. In two months 23 blast furnaces have returned to operation. Thirteen of these were lighted in May, the number active at the close of the month being 61, out of 289, the largest since February, 1932. The gain in stacks in May exceeded that of any month since January, 1930.

Even more vigorously than in recent weeks, the markets now reflect strongly the desire of consumers to anticipate a firmer price situation, universally expected to follow the application of the national industrial recovery act. A 10 to 15 per cent increase in the common labor wage rate is scheduled to be supported by an agreed increase in prices, possibly effective with the third quarter. Actual advances in the past week include $4 a ton on spot ferromanganese; $2 to $5 per 1000 for refractory brick; 8 per cent increases on nuts and bolts; and 5 per cent on boiler tubes and wire rope.

Additional support for the markets has originated with the railroads. The Chicago Great Western has purchased 500 steel box cars, requiring 25,000 tons of steel, a larger number than ordered from all private carbuilders in 1932. Seaboard Air Line is taking bids on 11,000 tons of rails; and Norfolk & Western on track fastenings commensurate with its recent inquiry for 10,000 tons of rails. New York Central has placed 7000 tons of rails, and Canadian government, 50,000 tons with dominion mills.

In bridge work, too, the railroads are beginning to show renewed activity; of the 11,100 tons of structural shapes awarded during the week, 4200 tons are for two railroad spans, and a much larger tonnage for railroad bridge work is pending in New York. For power transmission towers in Southern California bids are being taken on 28,000 tons of shapes; 20,000 tons additional to be purchased this year.

Automotive specifications continue at a high level, with current activity equal to early summer of 1931, and prospects still strong that June output of motorcars will exceed even that of May. Automotive consumers are pressing producers to protect them through the life of current models, and have obtained some third quarter contracts for sheets and strip at current prices.

The biggest increases in steelworks operations in the past week developed in the largest districts. Pittsburgh moved up 3 points to 30 per cent; and 5-point gains were made in Cleveland, to 64 per cent; in eastern Pennsylvania to 24½; and in Youngstown, to 52 per cent. The average for the Wheeling district was 80 per cent; New England, 59; Birmingham, 50; Chicago, 38; Buffalo, 33. Tin plate mill operations again advanced, to an average of 85 to 90.

A spectacular rise in Lake Superior iron ore shipments for May accompanied the climb in pig iron. Starting the season with 85,210 tons in April, ore producers moved 900,534 tons in May, more than eight times the volume for the month last year. Despite excessive stocks at lower lake ports and furnaces, revised estimates for shipments this season have risen to 10,000,000 tons.

All of STEEL's price composites this week are unchanged; iron and steel at $28.59; finished steel $45.10; and scrap $9.37. A reduction of 25 cents in scrap prices at Pittsburgh is offset by an increase in eastern Pennsylvania.

Composite Market Averages

	June 3	May 27	One Month Ago May, 1933	Three Months Ago Mar., 1933	One Year Ago June, 1932	Ten Years Ago June, 1923
Iron and Steel Composite	$28.59	$28.59	$28.45	$28.35	$29.54	$46.46
Finished Steel Composite	45.10	45.10	45.10	45.60	47.64	68.33
Steelworks Scrap Composite	9.37	9.37	9.23	6.47	6.62	18.30

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	June 3, 1933	May 1933	March 1933	June 1932
Pig Iron				
Bessemer, del. Pittsburgh	$17.26	16.66	15.76	15.95
Basic, valley	15.00	14.40	14.00	14.50
Basic, eastern, del. eastern Pa.	16.19	15.69	13.50	14.50
No. 2 foundry, del. Pittsburgh	16.76	16.16	15.76	16.01
No. 2 foundry, Chicago	16.00	15.90	15.50	16.00
*Southern No. 2, Birmingham	12.00	12.00	11.00	11.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	16.76	16.26	13.76	14.76
Malleable, valley	15.50	14.90	14.50	14.50
Malleable, Chicago	16.00	15.90	15.50	16.00
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	16.63	16.03	15.63	15.63
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	74.99

*1.75-2.25 silicon. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.75	1.75	2.00
Connellsville, foundry, ovens	2.25	2.25	2.25	3.00
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	June 3, 1933	May 1933	March 1933	June 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.91
Iron bars, Chicago	1.65	1.65	1.65	1.65
Shapes, Pittsburgh	1.60	1.60	1.60	1.60
Shapes, Philadelphia	1.65	1.65	1.65	1.75
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.50	1.50	1.60	1.60
Tank plates, Philadelphia	1.54½	1.49½	1.59½	1.79½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.55	1.55	1.55	1.70
Sheets, No. 24, hot ann., Pitts.	2.00	2.00	2.00	2.20
Sheets, No. 24, galvan., Pitts.	2.70	2.70	2.60	2.85
Sheets, No. 10 blue anneal., Chi.	1.80	1.75	1.70	1.85
Sheets, No. 24 hot ann., Chicago	2.25	2.20	2.15	2.35
Sheets, No. 24 galvan., Chicago	2.85	2.85	2.75	3.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	1.85	1.85	1.85	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts.	$11.50	11.65	8.75	9.00
Heavy melting steel, eastern Pa.	9.50	9.04	6.50	6.25
Heavy melting steel, Chicago	8.50	8.70	5.25	5.60
No. 1 wrought, eastern Pa.	10.25	10.25	6.75	6.25
No. 1 wrought, Chicago	8.10	8.10	5.00	5.00
Rails for rolling, Chicago	10.25	10.25	7.95	7.75

Sheets

Lake Mills Increase Operations on Heavy Automotive Tonnage —Defer Price Announcement

SHEET PRICES, PAGE 53

Cleveland — Further gains are noted in sheet mill operations, with increasing specifications from the automotive, refrigerator, washing machine industries, and more diversified buying. The Cleveland mills have stepped up to 65 to 70 per cent; and in an adjacent lake district they have increased to 80 per cent. Releases from General Motors, Ford and Chrysler are consistently heavier, and the belief prevails that these interests are accumulating stocks in anticipation of higher prices for third quarter. The electrical refrigerator industry is working at capacity, and as its season was late in getting started present demand is expected to hold up through June and July, and possibly August. The majority of sellers have not opened books for third quarter, despite innumerable inquiries, and the fact some makers have advanced all grades $3 a ton. That there will be a general increase is considered certain, but producers are holding off in an endeavor to appraise costs over the next three months.

Pittsburgh — Demand continues strong, with prices still unsettled. Little test has been afforded the asking prices of $3 over the present market, which advance will apply for the third quarter. A leading sheet mill continues to withhold prices for third quarter until costs are determined. Black sheets are being specified generally at 2.00c, base, Pittsburgh, with the asking price on galvanized sheets 2.70c. On second quarter contracts full-finished sheets are moving at 2.05c and 2.45c, for Nos. 10 and 20 gage, respectively.

Boston—Most of the larger consumers are covered at old prices for the remainder of the quarter and are specifying fair shipments. The refrigerator builder is assembling the largest number of units since going into production.

Chicago — While sheet demand last week lacked improvement, specifications retained previous gains. Automotive orders remain heavy and have held up longer than anticipated, but are expected to moderate in the near future. Miscellaneous consumers generally are active, and improvement in some directions where requirements have been light for many months is anticipated. Better operations by farm implement manufacturers are looked for as a result of recent gains in sales. Third quarter contracting is deferred, proposed legislation lending some uncertainty to costs. An advance of $3 a ton over present prices tentatively is planned.

New York—Sheet sales here remain well below normal. As the end of the quarter approaches improvement is expected because of prospects for higher prices. Most sellers have not opened their books for third quarter. Only one mill has taken a definite stand on galvanized sheets for that period, naming 2.85c, base, Pittsburgh.

Philadelphia—Most sheet mills are withholding quotations for third quarter, certain producers having withdrawn the $3 advance announced two weeks ago. Specifications against contracts are fairly active. Radio and autobody demand is holding up, and a larger tonnage is expected for beer barrels. The Baldwin-Southwark Corp. is to manufacture air conditioning equipment, which it is expected will require considerable tonnage of steel sheets.

Cincinnati—Sheet mills in this district decline to quote for third quarter. Present business on galvanized, which is in heavy demand, is booked at 2.85c, base, Pittsburgh. Mill operations remain at about 50 per cent.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10 (24 to 48 inches wide)

Pittsburgh, base	1.50c to 1.65c
Chi. dist. mills	1.60c to 1.75c
Chicago, del.	1.65c to 1.80c
New York, del.	1.75c
Birm., base	1.65c to 1.80c
Philadelphia, del.	1.71c
St. Louis, del.	1.84c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.65c to 1.80c
Chi. dist. mills	1.75c to 1.90c
Chicago, del.	1.80c to 1.95c
Phila., del.	1.96c
New York, del.	2.00c
St. Louis, del.	1.99c
Birm., base	1.80c to 1.95c
San Fran., c.i.f.	2.12½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.10c to 2.25c
Chi. dist. mills	2.20c to 2.35c
Chicago, del.	2.25c to 2.40c
New York, del.	2.45c
Phila., del.	2.31c to 2.41c
Birm., base	2.25c to 2.40c
St. Louis, del.	2.59c
San Fran., c.i.f.	2.75c

GALVANIZED No. 24

Pittsburgh, base	2.70c to 2.85c
Chi. dist. mills	2.80c to 2.95c
Chicago, del.	2.85c to 3.00c
Philadelphia, del.	3.01c
New York, del.	3.05c
Birm., base	2.85c to 3.00c
St. Louis, del.	3.19c
San Fran., c.i.f.	3.35c

TIN MILL BLACK No. 28

Pittsburgh, base	2.30c
Gary, base	2.40c
St. Louis, del.	2.64c

MILL RUN COLD-ROLLED No. 10

Pittsburgh, base	1.95c
Chicago, del.	2.10c
Philadelphia, del.	2.26c
New York, del.	2.30c

No. 20

Pittsburgh, base	2.40c
Chicago, del.	2.55c
Philadelphia, del.	2.71c
New York, del.	2.75c

AUTO. AND FURNITURE

Pittsburgh, No. 10	2.15c
Pittsburgh, No. 20	2.60c

ENAMELING SHEETS

Pitts., No. 10	2.40c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract	$4.25
Do., stock	3.75
Long ternes, No. 24 unassorted	2.75c to 2.90c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23 30%.

Steel Plaets

Pittsburgh, base	1.50c to 1.60c
New York, del.	1.60c to 1.70c
Phila., del.	1.49½ to 1.59½
Boston, del.	1.72c to 1.82c
Buffalo, del.	**1.85½c**
Chicago, base	**1.70c**
Cleveland, del.	1.80½c
Birmingham, base	**1.75c**
Coatesville, base	1.40c to 1.50c
Pacific Coast, c.i.f.	1.75c
St. Louis, del.	**1.94c**

Structural Shapes

Pittsburgh, base	**1.60c**
Philadelphia, del.	**1.65c to 1.75c**
New York, del.	**1.77c to 1.87c**
Boston, del.	**1.90½c to 2.00½c**
Chicago, base	**1.70c**
Cleveland, del.	1.80½c
Lackawan., base	**1.70c**
Birmingham, base	**1.75c**
Pacific Coast, c.i.f.	**2.10c**
Do., wide flange	**2.20c**

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	**1.70c**
Birmingham, base	**1.75c**
Lackawan., base	**1.70c**
Pacific Coast, c.i.f.	**2.00c**
Cleveland, base	**1.65c**
Philadelphia, del.	**1.91c**
New York, del.	**1.95c**
Boston, del.	**2.02c**
Pitts., cold finish	**1.70c**
Pitts., forg. qual.	**1.75c and 1.85c**
San Fran., c.i.f.	**2.10c**

RAIL STEEL

Pitts., Buff.	1.50c
Chicago, base	1.50c
*Eastern mills	1.50c

IRON

Chicago, base	**1.60c to 1.65c**
New York, del.	**1.85c to 1.90c**
Philadelphia, del.	**1.81c to 1.86c**
Pitts., refined	**2.70c to 4.20c**

REINFORCING

New billet steel, Chi., Pitts., Buff., Cleve., Birm. (cut lengths)	1.75c
Chicago, rail steel	1.50c
Phila., cut lengths	1.86c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher with 10% discount off extras; joint carloads 10 cents higher with no discount from extras; pool carloads 20 cents up; less carloads 30 cents up.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.85
Cement coated nails	1.85
Galvanized nails	3.35

(Per pound)

Polished staples	2.55c
Galvanized fence staples	2.80c
Barbed wire, gal.	2.35c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.)	$50.00

(To Manufacturing Trade)

Plain wire, 6-9 ga.	2.10c
Spring wire	3.10c

Anderson, Ind., $1 over Pitts.-Cleve.; Chicago, Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Cold-Finished Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.70c
20,000 to 59,999 lbs	1.65c
60,000 to 99,999 lbs	1.60c
100,000 lbs. and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c.

Shafting

Cumberland, Md., base

1⅛-inch	3.00c
1⅞ to 1½-inch	2.50c
1⅝ to 1⅞-inch	2.20c
2⅛ to 6-inch	2.05c

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base 2.45c to 2.65c. Differentials to various classes of consumers.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20
4100 .15 to .25 Mo.			0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.			1.05
5100 .80-1.10 Cr.			0.45
5100 Cr. spring			0.20
6100 bars			1.20
6100 spring			0.95
Cr., Ni., Van.			1.50
Carbon van.			0.95
9250 (flats)			0.25
9250 (rds., sq.)			0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
Do., del. Phila.	1.86c to 1.96c
Do., del. N. Y.	1.90c to 2.00c
Cooperage hoop, Pittsburgh	1.65c
Do., Chicago	1.75c
Cold-rolled strip Pitts., Cleve.	2.00c
*Worcester, 3 tons or over	2.10c to 2.20c

Rails, Track Material

Stand. rails, mill	$40.00
Relaying rails, Pitts., 20-45 lbs.	$20.00 to 22.00
50 to 75	$16.00 to 18.00
80 to 100	$20.00 to 21.00
Light rails, 25-45, mills	$30.00
Light rails, Chi.	$32.00
Angle bars, mills	2.55c
Spikes, R. R. mills	2.15c
Spikes, boat, b'ge, Pitts.	2.65c
Track bolts, Chi.	3.50c
Do., stand., job.	73 off list
Tie plates, Pitts.	$35.00
Tie plates, Chi.	$35.00

Rivets, Wrought Washers

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chi.	2.35c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 10 off
Washers, c.l., Pitts. dist.	6.50 to 6.75 off
Do., Chi. dist.	7.25 to 7.00 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots, Dec. 1, 1932, l.stx.

CARRIAGE BOLTS

*All sizes, cut thread	73 off
*Rolled thread ½ x 6 and smaller	73 off
*Eagle list	73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-3-3-7 heads, tap bolts, blank bolts, stud bolts without nuts 73 off

*Galv. tire bolts	60 and 10 off
*Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
*Rolled thread machine bolts, ½ x 6 and smaller, 73 off.	

NUTS

*Semifinished	73 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in. diam., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Cut Nails, Piling

Cut nails, c.l., Pitts.	$2.50
Do., less carloads, 5 kegs or over	$2.90
Steel piling, Pitts.	1.90c to 1.95c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

All discounts are net.

BUTT WELD Steel

In.	Blk.	Gal.
¼ and ⅜	60½	42
½	65½	54
¾	69	59
1—3	71	62

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD Steel

2	66	57
2½ to 6	69½	60½
7 and 8	68	58
9 and 10	67	57
11 and 12	66	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

(*Please turn to next page*)

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4, 1932, except Buffalo del. at Boston. Asterisk denotes price change.

Pig Iron

Per Gross Ton

FOUNDRY NO. 2

Chicago, furnace	$16.00
Pitts., dist. fur.	16.00
Pittsburgh, del.	16.63-17.13
Valley furnace	15.50
Cleve. fur., loc. del.	15.50
Philadelphia, del.	16.26
Virginia furnace	17.25
Granite City, Ill.	16.00
St. Louis, del.	16.85
Buff., fur., local del.	16.00
Buff., all-rail, Bost.	19.05
Buff., del. Brook.	18.25-18.75
Buff., del. Newark.	16.75-17.25
Ala., Birmingham	12.00
Ala., del. Chicago	16.25-16.78
Ala., del. St. Louis	16.35
Ala., del. Cincinnati	16.51
Ala., Phila., dock del.	17.00-17.25
Ala., Balt., dock del.	17.00
Ala., N. Y. dock	17.50
Ala., Bost. dock del.	17.50-17.75
Tenn., Bir. base	13.00
Tenn., del. Cinci	16.51
Montreal, del.	23.00-23.50
Eastern, del. Phila.	16.76

FOUNDRY NO. 2X

Buff., fur., local del.	16.50
Buff., del. Brook.	18.75-19.25
Do, Newark	17.25-17.75
Buff., all-rail, Bost.	19.55
Virginia furnace	17.75
Eastern, del. Phila.	16.76

FOUNDRY NO. 1X

Buff., fur., local del.	17.50
Eastern, del. Phila.	17.26
Buff., del. Brook.	19.25-19.75
Buff., del. Newark.	17.75-18.25

MALLEABLE

Valley furnace	15.50
Cleve. fur., loc. del.	15.50
Pittsburgh dis. fur.	16.00
Pittsburgh, del.	16.63-17.13
Chicago, furnace	16.00
Buff., fur., loc. del.	16.50
Eastern Pa., del.	17.13-18.91
Granite City, fur.	16.50
Montreal, del.	24.00
Toronto, delivered	22.60

BASIC

Pitts., dist. fur.	15.50
Pittsburgh, del.	16.13-16.63
Eastern Pa., del.	16.00-16.25
Buff., fur., loc. del.	15.50-16.00
Montreal, del.	23.50
Valley, furnace	15.00

BESSEMER

Valley furnace	16.00
Pittsburgh fur.	16.50
Pittsburgh, del.	17.13-17.63

LOW PHOS.

Valley fur. stand.	24.00-25.00
Phila., standard	22.76-26.79
Copper bear., E. Pa. furnace	22.00-23.00

GRAY FORGE

Valley furnace	15.50
Pitts., dist. fur.	16.00
Pittsburgh, del	16.63-17.13

CHARCOAL

Lake Sup., del. Chi.	23.04

SILVERY

Jackson County, O., fur. 7%—$18.50; 8—$19; 9—$19.50; 10—$20; 11—$21; 12—$22; 13—$23; 14—$24; 15—$25; 16—$26 17—$27.

Pittsburgh and Buffalo furnace; 7 to 10—$20; 15—$23.

BESSEMER FERROSILICON

Jackson County, O., fur., 10%—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
No. Afr. low phos.	7.00
Swedish basic, 65%.	7.50- 8.00
Swedish low phos.	8.00
Spanish, No. Afr. basic, 50 to 60%.	7.00
Tungsten, spot, sh. ton unit, duty pd.	$10.75-11.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$16.50-17.50

Manganese Ore

(*Nominal*)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	nominal
So. African, 52%.	18 to 19 cts.
So. Afr., 49-51%	nominal
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Ala.	$35.00
Missouri	35.00

Second Quality

Pa., O., Ill., Ky., Md.	30.00
Missouri	30.00
Georgia, Alabama	30.00

MALLEABLE BUNG BRICK

All bases	40.00

SILICA BRICK

Pennsylvania	$35.00
Joliet, E. Chicago	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 to 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$11.50
Washed gravel, import duty paid tide, gross ton	$17.50

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess, Philadelphia	$26.00 31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts.	1.50c-1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$1.75
Connellsville fdry.	2.25- 2.50
Connell, prem. fdry.	4.00
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21- 8.81
Chi. ov., outside del.	7.00
Chicago, del.	7.75
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.00
Indianapolis, del.	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, ovens Connell. basis	4.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(*In dollars, except Ferrochrome*)

Ferromanganese, 78-82% tidewater, duty pd.	*$68.00
del. Pitts.	73.24
Spiegeleisen, 19-20%, dom., fur., spot†	24.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent.	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb., cont.	0.94- 1.00
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Diff. to apply to quantity.

*Spot for June shipment $4 higher.

LINE PIPE

Steel

⅛-inch, butt weld	54
¼—⅜, butt weld	59½
½, butt weld	64½
¾, butt weld	68
1—3, butt weld	70
2-inch, lap weld	65
2½—6, lap weld	68½
7—8, lap weld	67
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

Lap Welded Steel		*Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts, same as for hot rolled below. Charcoal Iron—Under 10,000 pounds; 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

Hot Rolled

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	40%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$32.00-33.00
4-in. Birm.	35.00-36.00
4-in. Chicago	43.40-44.40
6 to 24-in. Chicago.	40.40-41.40
6-in. & over, N. Y.	32.00-34.50
4-in. New York	34.50-36.50

Class A pipe $3 over Class B.

Stand. fitgs., Birm. base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Bars

Backlogs Being Formed and Users Ask Larger Quotas—Price Rise Considered Near

BAR PRICES, PAGE 53

Pittsburgh—Bar mills are entering June with a fair backlog and deliveries are being somewhat delayed. This is the first time in about two years that bar producers in this district have entered a new month with a rising unfilled order book. Buyers show no hesitancy over price. The present 1.60c, Pittsburgh, base is therefore firmer than in many months, especially so in view of the fact that a higher price for third quarter lacks only a definite confirmation. During the past week to ten days, orders for bar mill products have improved to approximately 40 per cent of this district's mill capacity and have risen to a point where demand in bars is comparable with that for sheets and strip and second only to tin plate among finished steel products.

Cleveland — Steel bar tonnage booked here in May was the largest in two years. A steadier flow of orders is being received by mills, with the number of active consumers increasing. Demand from automobile builders shows a further gain, with strong indications that June shipments will exceed those in the past month. Railroads are inquiring for prices for indefinite tonnages through third quarter. Sellers have not opened books for that period, but some of them may do so this week, intimating an advance. Farm implement manufacturers have told some bar sellers their market will not stand a rise in prices, as only the cheapest tools are being purchased.

Chicago—Steel bar specifications are in the best volume of the year and in some instances are in excess of any time during 1932. Sales of various types of farm machinery have increased recently and some interests anticipate heavier operations soon. Railroad requirements continue to lag. Demand from tractor manufacturers is fairly active. Announcement of third quarter prices is deferred, with soft steel bars at 1.70c, Chicago, rail steel bars 1.50c, and bar iron 1.60c.

Philadelphia—Some consumers of commercial steel bars are asking mills to ship them more tonnage than specified in their original quarterly contracts. The policy of the mills is to treat each case individually and, if the customer can show necessity, to supply the added tonnage. Meanwhile mills await developments before opening books for third quarter. An advance for that position appears assured. Some trade interests look for a rise of at least $3 and possibly $5. The current market is 1.60c, Pittsburgh, or 1.91c, delivered, Philadelphia.

Boston — Commercial steel and iron bars move in small lots, larger manufacturing consumers taking light shipments, with one or two exceptions. For the Portsmouth navy yard bids close June 13 on 20,160 pounds of corrosion-resisting hexagon and round bars and bids are in on a small tonnage of common steel bars for Boston. Prices are firm at 1.60c, Pittsburgh.

Cold-Finished Backlogs Grow; Prices Are Strong

Cold Finished Prices, Page 53

Pittsburgh—Third quarter prices on cold-finished steel bars are being delayed and producers are taking no stand. This is despite numerous requests by buyers for third quarter coverage and in some cases for the remainder of the year. May shipments of cold-drawn bars were 50 to 60 per cent over April, with sufficient backlogs to guarantee improved conditions through most of June, at least. Cold-drawn bars are quoted 1.70c, base, Pittsburgh, but only for the rest of June.

Plates

Tank and Barge Needs Give Market Activity — Railroads Not Yet Heavy Buyers

PLATE PRICES, PAGE 53

Pittsburgh—Tank work is becoming more active and there have been a few recent awards of river barge work, but little railroad or bridge work. Plates for tank work for an addition for the Valley Mead Brewing Co., Meadville, Pa., will be required. Several barge inquiries are promising at New Orleans, Memphis, Tenn., and one or two other down-river ports. One barge builder in this district reports closing on eight barges during the past week, requiring over 900 tons of plates. Gulf Refining Co., Pittsburgh, is reported to have purchased 152 steel and aluminum tank trucks which will require an unstated tonnage of plates. The market on plain material is 1.50c to 1.60c, Pittsburgh. No announcement affecting third quarter has been made. Dravo Contracting Co. has completed fabrication of about 300 tons of plates for a large drydock caisson gate for the United States navy at Norfolk, Va.

Cleveland — Plate sellers are avoiding commitments for third quarter, though railroads and other consumers are asking for prices covering third quarter requirements. Present costs are based on low wages, which the federal industrial plan may change rather abruptly, and with scrap and pig iron prices up, makers say, plate prices must follow the trend. Some are talking of an advance of $3 to $5 a ton; others, $2. Many orders are being received from consumers who have not purchased material for two years. Boilermakers' requirements show a moderate improvement. Some mills' operations are nearer to continuous schedules. The Cleveland plate mill is operating at an average of 45 to 50 per cent.

Chicago—Plate buying is improving slowly but not equally with lighter products. Orders from tank fabricators are moderately heavier with new work generally light. Railroads continue poor buyers and railroad equipment builders are taking little tonnage. Prospects for freight car buying remain indefinite. Occasional orders are being received for brewery tanks with additional business in prospect.

Boston—Miscellaneous plate buying in small lots is moderately active, but prices are less steady, 1.50c, Coatesville, Pa., being shaded more frequently. Brewery tanks, taking 200 tons at Providence, R. I., have been placed. Bids are being taken on a car or more of boiler plate steel for the navy shops at Charlestown, Mass.

Philadelphia—Plate requirements are expanding, with consumers specifying against contracts more actively than in any corresponding period in more than a year. The trade generally expects a substantial price increase for third quarter, although sellers have not opened their books, notwithstanding considerable pressure from consumers.

New York — Insistence by buyers

for third-quarter prices on steel plates has not been rewarded by quotations. A substantial tonnage of plates will be bought for a cracking still for the Mexican subsidiary of the Royal Dutch Shell Co., fabrication of which has been awarded the Alco Products Inc., New York. About 700 tons will be required for 150 tanks for the Feigenspan brewery at Newark, N. J.

Contracts Placed

240 tons, brewery tanks, Falls City Ice & Beverage Co., Louisville, Ky., to Biggs Boiler Works, Akron, O.

210 tons, shapes and plates, 500,000-gallon elevated tank, Conneaut, O., to Chicago Bridge & Iron Works, Chicago.

160 tons, two standpipes, Milton, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh; reported last week as 100 tons.

Contracts Pending

125 tons, water tank, Orrville, O.; bids this week.

Unstated tonnage, six corrosion-resisting gasoline stowage tanks, bureau of supplies and accounts, navy, two Boston, two Brooklyn, one Philadelphia, one Puget Sound; Struthers-Wells-Titusville Corp., Warren, Pa., low on alternate; Heil Co., Milwaukee, low on second alternate; bids May 23.

Railroads

Great Western Buys 500 Cars; Rail Inquiry Is Heavier

Track Material Prices, Page 53

Chicago Great Western has ordered 500 steel box cars from the Pullman Car & Mfg. Corp., Chicago, the first equipment order of size since 1931, except for the Pennsylvania's 1285 box cars in September, 1932, to its own shops. The cars will be 40 feet long and will require about 25 tons of steel each, including 11 tons of plates, shapes and sheets.

New York Central has awarded 7000 tons of rails, 5000 tons going to the United States Steel Corp. and 2000 tons to Bethlehem Steel Co.

Seaboard Air Line is inquiring for 11,000 tons of rails and Norfolk & Western is to open bids on 10,000 tons June 14. The latter road opened bids June 2 on 6000 kegs of spikes and is said to be negotiating for 1500 to 2000 tons of tie plates.

Pennsylvania railroad is resuming repairs to 1200 cars at its Altoona, Pa., shops, which was interrupted some time ago. Chesapeake & Ohio and Nickel Plate have inquired for plates. Inquiries for third-quarter material are coming out but mills will not quote. Pressed Steel Car Co., Pittsburgh, has been given an order for 42 narrow-gage passenger cars for Grant Park Transportation Co., Chicago.

The Canadian government has ordered 50,000 tons of rails from the Dominion Steel & Coal Corp. Ltd., Sydney, N. S., labor to be paid by the government and ore to be furnished by the company. Payment for the rails will be made when allocated to the railroads.

Car Orders Placed

Chicago Great Western, 500 steel box cars, to Pullman Car & Mfg. Corp., Chicago.

Rail Orders Placed

Canadian Dominion government, 50,000 tons, to Dominion Steel & Coal Corp. Ltd., Sydney, N. S. Financing plan in STEEL, April 3, page 44.

New York Central, 7000 tons, 5000 tons to United States Steel Corp., 2000 tons to Bethlehem Steel Co.

Rail Orders Pending

Norfolk & Western, 10,000 tons; bids June 14.

Seaboard Air Line, 11,000 tons rails; bids asked.

Strip

Heavy Buying, Specifications Follow Recent Price Advance

Strip Prices, Page 53

Pittsburgh—Several tonnage orders for hot-rolled strip have been closed for the third quarter at 1.60c, base Pittsburgh, representing a $1 a ton advance over the current market of 1.55c. One buyer recently bought 400 tons of hot-rolled for third quarter, paying 1.60c, Pittsburgh. The effect of the advance has been for buyers to specify second quarter contracts fully. Cold-rolled strip is more active at about 1.90c, Pittsburgh, but has not yet been tested for third quarter at the 2.00c asking price. Strip production here is close to 40 per cent.

Cleveland—More strip tonnage for miscellaneous manufacturing industries was booked here in May than in two years. A large portion was represented by household equipment, such as refrigerators, washing machines, kitchet cabinets, and beds. The manufacture of beer cases also continues to take considerable material. Automotive requirements, however, dominate; heavy shipments going to the leading builders in Michigan, and to partsmakers in this district. Prices are firm, with makers still refraining from committing themselves for third quarter.

Chicago—Strip orders have been stimulated moderately by price advances for third quarter. Active consumption by the automotive industry and other leading users has been an important factor in holding business equal to or better than its previous rate. Additional specifications are looked for over the next several weeks in anticipation of the $1 a ton advance in hot strip, to 1.70c, and the larger increase in cold-rolled strip. The latter is quoted 2.00c, Pittsburgh-Cleveland, for that period.

Boston — Cold-rolled strip mills selling on a Worcester, Mass., base are firm at 2.10c on current business, with 2.20c quoted after July 1.

Philadelphia—Strip sellers are withholding quotations for third quarter. Meanwhile, most tonnage is going at 1.45c, Pittsburgh, or 1.76c, Philadelphia, for hot-rolled and 1.80c to 1.90c, Pittsburgh, or 2.11c to 2.21c, Philadelphia, for cold-rolled. Some spot business is going at a $2 increase. Demand is still spotty.

Wire

Wire Rope Is Advanced; Buying Is Heavier

Wire Prices, Page 53

Pittsburgh — Several important wire buyers are attempting to obtain full third-quarter coverage. It is the policy of wire producers, however, to quote only through July 15. Beginning with third quarter, contracts are to be on a month-to-month basis with all tonnage ordered in a month to be specified by the fifteenth of the month following. Prices now being quoted are $1.85 per keg for nails and 2.10c, Pittsburgh, for manufacturers' wire. An advance in this schedule is an early probability.

Cleveland—Wiremakers have not opened books for third quarter, though receiving more inquiries. Some interests tell consumers anxious to cover that uncertainties regarding federal industrial legislation make it difficult to quote now. The current market is strong, and some wire consuming interests are raising their prices.

Chicago—Wire products demand continues heavy. Specifications and shipments during May were the best for that month since 1930. Specifications from manufacturers' wire consumers have expanded steadily, while the movement in agricultural districts also has quickened moderately. Producers defer announcement of third quarter prices and contracts are not being accepted for that period pending a decision on quotations.

Worcester, Mass. — Wire rope

prices have advanced 5 per cent, effective June 1. Demand for wire specialties holds well and miscellaneous buying of standard products has gained, including manufacturers' wire. Continued gains are made without support of several important outlets, including building.

Mirrors of Motordom

(*Concluded from Page* 23)

surplus and reserves during the year.

Ford assets as of Dec. 31, 1932, are given as real estate, $161,774,842; machinery and equipment, $126,243,611; inventory, $67,814,080; cash, notes, accounts receivable, etc., $303,186,085, and deferred charges, $5,909,690, a total of $644,928,308. The Ford showing for preceding years was given in STEEL for Feb. 6, 1933, page 16.

General Motors, of course, continues first in production. Its June schedules, which naturally are tentative at this date, call for about 88,000 units, or 13,000 more than in May.

Chevrolet production rose from some 59,000 units in April to more than 65,000 in May. At the outset of the month, the schedule is always pessimistic, but retail sales show no shrinkage and basic conditions point to a June equally as good as May. Many departments are operating 6 days a week.

No Summer Letdown

Pontiac this month may go as high as 14,000 units. Buick and Olds each are on about a 4000-a-month basis, and Buick officials are confident they can operate until Oct. 1 on substantially this basis. Cadillac-LaSalle has scheduled 650 cars this month, 100 more than last month. Olds, incidentally, made more sixes and eights in five months of 1933 than in all 1932.

Thus, General Motors at 88,000, Chrysler at 60,000 and Ford at 55,000 units indicate 203,000 units this month. From Hudson-Essex the industry looks for almost 6000 cars this month, and from Hupp, Graham and Packard an average of 1000 each. Then there are Nash, Studebaker, Auburn, Reo, Willys, Franklin, Lincoln, Continental and several others to push the month above 225,000.

A June allotment of 1000 to Hupp appears conservative considering the fact that in May it shipped 1007 cars, an increase of 46 per cent over April and 32 per cent over May, 1932. Shipments in May plus the carryover into June were 32 per cent greater than the showing one month ago.

Roy D. Chapin left Hudson as chairman of the board when he entered the Hoover cabinet as secretary of commerce, but he returns as president. This is taken to indicate a more vigorous policy. A rather thorough redesign of Hudson next year is a possibility.

With another default in interest, the troubles of Studebaker are multiplying, and the possibility of the White group emerging dominant is worth considering. Willys, the other large automotive interest in receivership, is trying hard to re-establish itself, having reopened its southern California branch at Los Angeles on a full 6-day week June 1.

Austin has advanced its f.o.b. prices $15 per car, put up wages 15 per cent and has stepped up to a 5-day week. Its first quarter sales were seven times those of a year ago . . . . Murray Body, now employing 6200, is operating its body division two shifts . . . . A. O. Smith Corp., Milwaukee, is producing about 90,000 automobile frames monthly.

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Structural Shapes

Awards and Pending Tonnages for Railroad Bridges Are Heavier — 4200 Tons Placed for Two Structures —48,000 Tons to Be Purchased for Electric Towers

STRUCTURAL SHAPE PRICES, PAGE 53

New York—Two projects, taking close to 28,000 tons, hold interest in the structural field. Frederick Snare Corp., New York, is low on the general contract for the 12,000-ton Hudson river bridge at Catskill, N. Y. Figures on the New York Central viaduct, 16,000 tons, go in this week. State hospital requirements and brewery construction take several thousand tons, one brewery project, 2200 tons.

Pittsburgh—American Bridge Co., Pittsburgh, has entered a contract for 1370 tons for mine shaft sets to be installed at Lead, S. Dak., for the Homestake Mining Co. A Pennsylvania state letting June 16 includes a 600-ton two-span truss steel bridge in Lycoming county. Prices ranging from 2.20c to 3.21c were entered on 7208 pounds of plain structural I-beams in connection with a project on route 175, section 9 between Lehigh and Northampton counties, which was bid to the state May 26. Phoenix Bridge Co. was low at 2.20c followed by McClintic Marshall Corp. at 2.50c. Plain structural material is 1.60c, Pittsburgh.

Cleveland—The Erie railroad has awarded McClintic-Marshall Corp., Bethlehem, Pa., 1800 tons of shapes for a bridge at Elmira, N. Y. One of the few awards made by the state of Ohio this year is for 120 tons for emergency bridge work at Bainbridge, O. Cleveland is going ahead with plans for an incinerator which will require several hundred tons of steel. Private work is light. Plain material holds at 1.60c, base, Pittsburgh.

Chicago—Structural awards of about 6000 tons and new inquiries for 2000 tons are made up almost entirely of private work. While new business is increasing, small lots generally predominate. Piling inquiry is fairly active and includes a 550 ton project in Wisconsin and one requiring 800 tons in Michigan. A bridge at Joliet, Ill., taking 2400 tons, and a building at East Moline, Ill., involving 700 tons have been placed.

Boston—Structural demand continues light. Berlin Construction Co. Inc., Berlin, Conn., recently took a small tonnage for an addition to the plant of the Wallingford Steel Co., Wallingford, Conn. Plain material is 1.60c, Pittsburgh.

Philadelphia—Building construction continues negligible. The Baltimore pier project of the Pennsylvaiia railroad, on which bids were opened May 26, continues to occupy attention. Indications point to the award going to an eastern Pennsylvania fabricator should the project go ahead.

Contracts Placed

5600 tons, addition to open-hearth soaking pit and gas producer buildings. Great Lakes Steel Corp., Detroit, to Whitehead & Kales Co., Detroit. Previously reported as 3500 tons.

2400 tons, bridge, Joliet, Ill., for Elgin, Joliet & Eastern railroad, to American Bridge Co., Pittsburgh.

1800 tons, bridge for Erie railroad, Elmira, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

700 tons, building, East Moline, Ill., for International Harvester Co., to Rock Island Bridge & Iron Works, Rock Island, Ill.

700 tons, caissons for Golden Gate bridge, San Francisco, to Moore Drydock Co., Oakland, Calif.

600 tons, piling, shore protection, Ft. Screven, Ga., to Jones & Laughlin Steel Corp., Pittsburgh.

400 tons, building for Providence Journal, Providence, R. I., to Harris Structural Steel Co., New York; through James Stewart & Co., New York.

400 tons, piling, federal engineer, Savannah, Ga., to Jones & Laughlin Steel Corp., Pittsburgh.

300 tons, six derrick units for interbay bridge project, San Francisco, to Isaacson Iron Works, Seattle.

255 tons, Kress store, Phoenix, Ariz., to McClintic-Marshall Co., Bethlehem, Pa.

250 tons, grain elevator, Chicago, to Gage Structural Steel Co., Chicago.

225 tons, gas holder, Ambler, Pa., for Cruise Kemper Co., to Phoenix Bridge Co., Phoenixville, Pa

200 tons, bridge, Union Pacific railroad, to American Bridge Co., Pittsburgh.

125 tons, two-story bottling plant, Joseph S. Finch & Co., Schenley, Pa., to Rust Engineering Co., Pittsburgh.

125 tons, state highway bridge, Bainbridge, O., to Burger Iron Co., Akron, O.

120 tons, hangar, Pan-American Airways Inc., Alaska, to McClintic-Marshall Corp., Bethlehem, Pa.

100 tons, Tumwater Brewing Co. plant, Olympia, Wash., to Isaacson Iron Works, Seattle.

100 tons, crossing over Santa Fe tracks near San Bernardino, Calif., to unnamed interest.

100 tons, printing plant, Louisville, Ky., to Bedford Foundry & Machine Co., Bedford, Ind.

100 tons, bridge, Jennings county, Indiana, to Midland Structural Steel Co., Chicago.

Shape Awards Compared

	Tons
Week ended June 3	11,100
Week ended May 27	18,729
Week ended May 20	3,090
This week in 1932	30,843
Weekly average, 1932	14,285
Weekly average, 1933	15,181
Weekly average, May	39,377
Total to date, 1932	353,077
Total to date, 1933	349,168

Contracts Pending

28,000 tons, transmision towers for Water and Power bureau, Los Angeles; bids about June 10.

20,000 tons, transmission towers for metropolitan water district; bids in latter part of year.

12,000 tons, Rip Van Winkle (Catskill-Hudson) bridge, Greene-Columbia counties, New York; Frederick Snare Corp., New York, low; bids June 1.

2400 tons, pier and quays, Pearl Harbor, T. H.

2200 tons, brewery stock house for Jacob Ruppert Co., New York.

800 tons, piling, Sand Products Co., Muskegon, Mich.; Edward C. Gillen Co., Milwaukee, general contractor.

600 tons, two-span truss steel bridge, Jersey Shore borough, Lycoming county, Pennsylvania, for the department of highways; bids at Harrisburg, Pa., June 16. Project includes 81 tons of plain steel bars.

550 tons, piling, dam, Prairie du Chien, Wis., for Wisconsin Power & Light Co.

550 tons, jail work, San Francisco; new bids to be called for.

500 tons, intake towers, Boulder dam, Nevada.

500 tons, Leavenworth Central school, Wolcott, N. Y.

320 tons, grade separation, Detroit, for Michigan Central railroad.

274 tons, boiler house, Baltimore; previous bids rejected.

250 tons, beam span, Wabash railroad.

250 tons, bridge, Kenosha, Wis., for Chicago, North Shore & Milwaukee railroad.

250 tons, wholesale market, Louisville, Ky., for Swift & Co.

240 tons, viaduct, Cincinnati, for Island Creek Coal Co., Cincinnati.

150 tons, Michigan state highway bridge, Southfield, Mich.

150 tons, bureau of supplies and accounts, navy department, Washington; inquiry also includes boiler steel plates and commercial steel bars; bids June 6.

115 tons, highway, Longview, Tex.; bids June 13.

Pittsburgh Screw & Bolt Corp., Pittsburgh, reports net loss of $799,680 after charges, depreciation and interest, compared with loss of $516,846 in 1931. Production tonnage was 57 per cent less than 1931.

Concrete Bars

Market Is Quiet, but Prices Are Firm, and Higher in Some Districts — Tests of Recent Advances in New York Territory Coming on Bids for Two Large Bridges

REINFORCING BAR PRICES, PAGE 53

Cleveland—Cut lengths of new billet steel reinforcing bars, to contractors, have been raised approximately $3 a ton, to 1.75c, base, Cleveland, for lots over 5 tons, and to 1.90c to smaller orders. Some sellers are holding to 1.90c for less than carloads. For mill lengths to distributors the price, recently advanced, holds at 1.50c, Cleveland. About 1500 tons are being figured here for three public projects. State road work still is lacking.

Pittsburgh—New billet steel reinforcing bars have been quoted since June 1 on the basis of 1.60c, Pittsburgh, to distributors and 1.75c for cut lengths. Concrete bar specifications are heavy. Considerable reinforcing bar tonnage is included in the Rip Van Winkle bridge, New York, and the New York Central railroad's viaduct in New York.

Chicago—Only small tonnages are involved in new inquiry for private construction, while public projects remain few. Indiana has yet to award formally 500 tons of bars for road work, although contracts are tentatively placed. Prices are fairly steady.

Boston — Inquiry is limited to smaller lots, with higher prices on billet, highway mesh and rail steel still unestablished on important new business. Rail steel bars have been marked up to 1.50c, eastern mill. Legislation recently passed by Connecticut now is in force by which contractors' bonds cover the full amount of the contract, provide completion of the contract and payment for all materials, the latter clause being highly satisfactory to steel sellers.

New York—Recent advances on billet steel reinforcing bars are being subjected to first tests by the Catskill, N. Y., bridge and New York Central viaduct here. Other inquiry is light. Rail steel bars have been advanced $4 a ton to 1.50c, eastern mill on new business, effective June 1.

Philadelphia—Reinforcing bar demand remains light, with some small miscellaneous bridge work for the state of Pennsylvania soon to be placed. Most of this work is in Berks, Dauphin and Lebanon counties. Billet steel bars are unchanged, although an increase is reported in rail steel bars.

Contracts Placed

432 tons, specification 3080, Bureau of Water and Power, Los Angeles, to Pacific Coast Steel Corp., Los Angeles.
200 tons, building for Providence Journal, Providence, R. I., to Truscon Steel Co., Youngstown, O.; through James Stewart & Co., New York.
110 tons, warehouse, Swift & Co. Inc., Brooklyn, N. Y., to Concrete Steel Co., New York.

Contracts Pending

500 tons, Rip Van Winkle bridge, New York; Frederick Snare Corp., New York, low.
379 tons, schedule 2178, Panama canal opening of June 1; Jones & Laughlin Steel Corp., Pittsburgh, low.
300 tons, dock and market building, Muskegon, Mich.
240 tons, dam, Prairie du Chien, Wis., for Wisconsin Power & Light Co.
130 tons, bridge No 11, Cincinnati, for Chesapeake & Ohio railroad.

Tin Plate Operations Continue to Advance

Tin Plate Prices, Page 53

Pittsburgh—Tin plate mill operations have gone up 5 points to 85 to 90 per cent. The rate will be sustained at least at 80 per cent through June. American Sheet & Tin Plate Co. scheduled operations at all of its 30 tin mills at Farrell, Pa., last week for the fifth successive week, and 12 mills in the New Castle, Pa., works are being reopened this week after 15 months of idleness. A recent survey of tin plate operations in this and the nearby valley districts shows 110 of 114 mills operating at four plants. It is likely that the $4.25 price on tin plate will be revised for the third quarter. Tin mill black sheets are quoted 2.30c base, Pittsburgh.

New York—With Straits tin now hovering around 40c per pound, prospects for an advance in tin plate in the near future appear even more definite than a fortnight ago. Specifications continue heavy.

Concrete Awards Compared

	Tons
Week ended June 3	742
Week ended May 27	833
Week ended May 20	1,985
This week, 1932	6,211
Weekly average, 1932	3,920
Weekly average, 1933	2,979
Weekly average, May	4,178
Total to date, 1932	103,962
Total to date, 1933	68,521

Refractories Are Up $5

Refractories Prices, Page 54

Pittsburgh—Effective immediately, but only for the balance of June, both first and second quality fire clay refractories are advanced $5 per 1000. Malleable bung brick and Pennsylvania silica are up $5, and Joliet silica is up $2. The balance of the schedule is unchanged and no third quarter prices have been named.

The Business Week In Washington

(*Concluded from Page 22*)

What is called the regular basis is largely the ratio of population and roads of a certain state to the totals for the United States.

The proposed allotment would give New York a total of $25,489,621; Texas, $23,780,300; Pennsylvania, $20,973,540; Illinois, $18,950,435; Ohio, $16,637,016, California, $16,255,870; Michigan, $13,355,190; and Missouri, $12,475,584.

LOOK for important developments shortly concerning Russia. The Roosevelt administration has been quietly gaging the possibility of increased trade with the soviets, for one thing ascertaining how barter arrangements can be worked out.

Russia needs cotton, livestock and machinery, to cite only three major commodities. She can ship lumber, pulpwood, certain foodstuffs and, among the minerals, manganese and chrome ore.

Nothing is so controversial as relations with Russia, either business or diplomatic. Domestic producers of manganese, having inserted an antiforeign-material clause in the public works section of the industrial revival bill, will fight any attempt to let down the bars.

There is a big possibility that the machinery purchases of the Amtorg Trading Corp. may again become a big factor in the market.

Pipe

Considerable Tonnage Pending, But Buyers Are Slow to Close— Prices Firm in Most Districts

PIPE PRICES, PAGE 53

Pittsburgh—Standard pipe is showing minor improvement in demand, but owing to continued quiet in oil country goods seamless pipe is moving only in small lots. No line pipe projects are before pipe producers for immediate closing. The present discounts on all grades of pipe are fairly well observed, and a price advance for third quarter is possible. Pipe mill operations in this district are not much above 15 to 20 per cent. Sharon Tube Co.'s plant, Sharon, Pa., idle for a period, resumed June 2.

Cleveland—Steel boiler tubes have been advanced about 5 per cent by leading makers, applying to both warehouse and mill shipments. The market for pipe here continues quiet, with a dearth in building operations.

Chicago—Cast iron pipe orders have been light while inquiries recently have involved small lots. A fairly large tonnage is pending, however, and considerable work is in prospect which has not reached the point where bids are being asked. Chicago has yet to place orders for 1370 tons on which bids are in. Carload purchases are slightly more active.

San Francisco—Cast iron pipe on the Pacific coast has been advanced $3 per ton, the first indication of a firmer price trend in this product. Higher costs and larger demand as a result of Reconstruction Finance Corp. loans for water extensions are believed to have been the cause.

Boston—While several attractive lots of cast pipe are under consideration for bids in New England, awards are small. Springfield, Mass., bought 332 tons, 6, 8 and 12-inch centrifugal from the United States Pipe & Foundry Co., Burlington, N. J., at 51 and 78 cents and $1.32 per foot, delivered. Bids on standard cast pipe brought out $34.80, $37 and $38.50 a ton, delivered.

Birmingham, Ala.—Current business is not sufficient to warrant any material increase in production. Several contracts are in prospect. Prompt delivery is made on all specifications.

New York—For park work New York city has bids on 227 tons of cast pipe and fittings, while the department of purchases is expected to ask bids soon on about 800 tons. Lettings are light and inquiry is sluggish. Prices are untested. Pipe foundry operations in the East have dropped sharply at several plants.

Cast Pipe Placed

646 tons, 16 and 20-inch, Los Angeles, to American Cast Iron Pipe Co., Birmingham, Ala.

145 tons, state hospital water line, Marcy, N. Y., to Donaldson Iron Works, Emaus, Pa.

Steel Pipe Placed

100 tons, piping, power station, Potomac Electric Power Co., Washington, to Grinnell Co. Inc., Providence, R. I.

Cast Pipe Pending

1550 tons, 10 to 16-inch, metropolitan district commission, Boston.

1550 tons, 4, 6 and 8-inch class B, Oakland, Calif.; bids opened.

395 tons, 12 and 16-inch class 150, San Francisco.

227 tons, 6, 8 and 16-inch, pipe and fittings, city parks, New York; bids in.

Great Northern Ore Earnings Down Sharply

Trustees of the Great Northern Iron Ore Properties are "confronted with requests for even more drastic concessions than in 1932" from the lessees, and also with the prospect of some lease cancellations, they report in their current financial statement for 1932.

Shipments from the properties dropped to 587,217 tons in 1932, compared with 3,182,041 tons in 1931 and 7,092,312 tons in 1930. It was necessary to defer "a substantial portion" of the minimum shipments required to be made by lessees. Net profit for the year was $359,389.95. No distribution was made on certificates of beneficial interest. Profit before depletion and federal income tax was $1,031,245.76. The consolidated net income, given for 1931, which did not include a deduction for depletion, was $2,122,499.79.

Communications are being received by the department of commerce both for and against reciprocal tariff from the industrial interests of the country. It is understood that several steel companies have written the secretary of commerce favoring reciprocal tariff.

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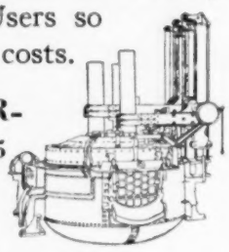

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Pig Iron

Current Buying Mostly Small Orders as Some Melters Still Specify on Old Contracts

PIG IRON PRICES, PAGE 54

Pittsburgh—Bessemer iron for ingot mold manufacture is leading in merchant demand. Many foundries are still specifying against lower-priced contracts placed before the $1 a ton advance of two weeks ago, and consequently have not entered further orders. Where small lots are being purchased melters are paying the full schedule on the new basis of $16 for foundry and malleable, $16.50 on bessemer and $15.50 for basic, all Pittsburgh district furnace. A smaller steelworks here which recently blew out its one active blast furnace for repairs is purchasing iron from a leading steel mill here. The Edgar Thomson blast furnace blown in by Carnegie Steel Co. May 29 ran bessemer iron several days for the mold shop before changing to basic June 1.

Cleveland—Sales have tapered, while shipments continue to increase. Furnace interests believe the movement in June will exceed that of May. In some instances where most of the tonnage shipped recently has come out of furnace stocks, tentative plans are being considered for lighting more stacks. New bookings by furnace interests with headquarters here during the week totaled approximately 4000 tons. Prices are firm.

Chicago—Sales are moderately more active following the lag which accompanied the recent advances of 50 cents a ton to $16, furnace, for No. 2 foundry and malleable. May sales were the best in more than a year but were only about twice the volume of shipments despite the fact that consumers in many instances are covering through third quarter. This is taken to indicate that buying, while partly speculative, has been predicated largely on expanding requirements. Some users now are taking out material that had been scheduled for July shipment. Farm implement manufacturers are expected to increase operations shortly, current requirements continuing light. While further advances in prices are in prospect as a result of probable increases in costs, these are expected to take the form first of a return to 50 cent silicon differentials.

Boston—Buying has declined, but prices are firm. Dutch iron is stronger for delivery near Providence, R. I., sellers quoting $15. Full 50-cent differentials are applying on Buffalo iron, quoted $14.50, furnace.

New York—Releases against contracts are somewhat heavier and the number of small orders improved. Prices are firm, with Buffalo plain iron holding at $16.75 to $17.25, delivered, Newark, N. J., and $18.25 to $18.75, Brooklyn. Eastern Pennsylvania iron continues $15.50, furnace.

Philadelphia—Sales are more numerous, although lacking in important tonnages. Bulk of current business is confined to orders of 100 tons or less. Eastern Pennsylvania foundry iron continues steady at $15.50, furnace, and eastern Pennsylvania basic at $15.25, furnace.

Buffalo — Active covering has caused most consumers to withdraw from the market with needs antici-

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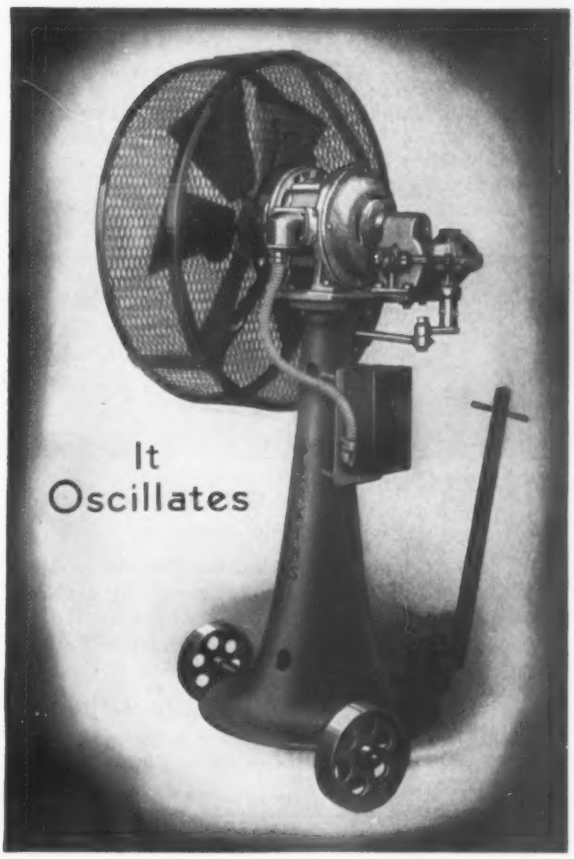

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pated well into third quarter. Suppliers will not quote for delivery beyond Oct. 1. Local sellers are greatly encouraged with the eastern situation, now obtaining a $14.50 minimum there, furnace base, with 50-cent differentials. District price of $16 is rigidly maintained.

Cincinnati—A sale of 500 tons of northern iron, to an Ohio consumer, proved new prices firm, other sales being in smaller lots. Several foundries on specialty work were in production during the holiday interruption last week.

St. Louis—New buying has fallen off, although the total movement in May represented the largest tonnage for a single month in more than a year. Foundry and mill business is expanding moderately. Jobbing foundries still have fair backlogs, with some co-operative shops running full time. Prices are steady, with no furnace selling further ahead than third quarter.

Birmingham, Ala.—Base price of $12, f.o.b. furnace, No. 2 foundry, is being maintained while shipments slightly exceed production. Melt in this district shows no change though belief is renewed that increased output at pipe shops is imminent.

Coke

Moderate Gain in Sales; Prices Show no Change

Coke Prices, Page 54

A moderate expansion in coal and coke orders, mainly for industrial plants, is noted. Coke for metallurgical purposes in the Pittsburgh district still is in quiet demand and prices are weak. The general schedule calls for $4, Connellsville ovens, on premium and $2.25, ovens, for common brands of foundry coke. Furnace coke ranges around $1.75. Fifty additional ovens at the bessemer plant of the Humphrey Coal & Coke Co., Pleasant Union, Pa., have been placed in operation.

May shipments of foundry coke at Chicago were the best in more than a year and the rising trend in foundry schedules points to continued good activity during June. Second half prices remain to be announced, the present contract prices of $7, ovens, for outside delivery and $7.75, delivered Chicago, continuing through June.

Wholesale price of domestic by-product coke has been advanced 25 cents to $4.75, at Cincinnati. Foundry coke remains at $8.05, delivered. Shipments of metallurgical coke at St. Louis is well maintained, shipments in May being the best of the year.

May Ore Shipments Eight Times Tonnage Year Ago

Iron Ore Prices, Page 54

Cleveland—Iron ore shipments from the Lake Superior district in May were more than eight times the tonnage in the month last year—900,534 tons, compared with 110,826. The movement in April this year amounted to 83,210 tons. Last year shipments were being sharply curtailed, while this year the trend is upward; and according to revised estimates for the season may approximate 10,000,000 tons, nearly three times the 1932 tonnage. Of the 900,534 tons moved in April, 600,000 tons came from Duluth and Two Harbors, and nearly all of this was iron ore for United States Steel Corp. plants. Last year the corporation's vessels did not get started until July. The market is quiet and prices for the season have not been determined.

New York—An inquiry is out for rates on the movement of 85,000 to 150,000 tons of foreign iron ore from Montreal to the Buffalo district, according to reliable reports in shipping circles here. Further details are withheld.

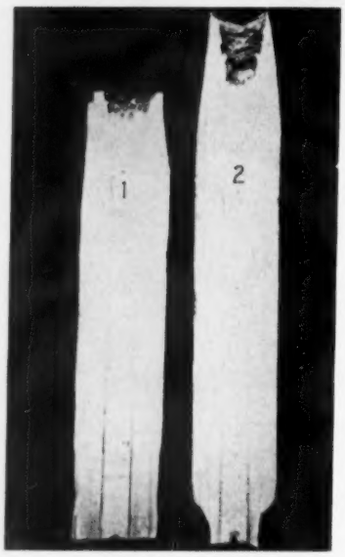
Ferromanganese Up $4 For Spot Shipment

Ferroalloy Prices, Page 54

Ferromanganese for spot shipment throughout June only has been advanced $4 a gross ton to $72, eastern seaboard. The contract price of $68 continues in effect for the current quarter, with third quarter quotations to be announced later. The trend in the spot price causes many to believe that the new contract price for next quarter will be up at least $4 a ton, and possibly higher. Specifications continue to increase. Domestic spiegeleisen, 19 to 21 per cent, is holding at $24, furnace, for spot delivery, with books unopened for last half.

Poole Engineering & Machine Co., Baltimore, has been recommended for the contract to supply 51 iron sinkers (1850 to 8500 pounds each), a total of 98 tons, for the lighthouse bureau, Staten Island, N. Y.

Let LIQUITOL Reduce YOUR INGOT COSTS



(1) Is treated with LIQUITOL A SPECIAL, the fluid metal is only poured to half of the head. The formation of the hole is such that the ingot is quite solid. The savings in 16 of these ingots is 1 ingot. This is only used for refined steel, that is to say, tool steel, cutting steel, and special steels of high quality.

LIQUITOL retards Cooling of hot-top metal.

Working on the theory that secondary piping is caused by occluded gases, it follows that if the hot-top is kept open longer gases have a better chance to escape.

Liquid metal in the hot-top allows for proper feeding and reduction in hot-top volume up to 40%.

LIQUITOL is recommended in production of alloy steel, as it is guaranteed not to contaminate metal.

LIQUITOL prevents bridging of hot-top metal, allowing a natural feed of metal down the hot-top sides.

THE ALPHA-LUX COMPANY, INC.
192 Front Street
NEW YORK CITY
Philadelphia Chicago

Scrap

Quiet Rules, with Strength Apparent—Melt Indicates Renewed Buying Soon

Pittsburgh—Weaker by 25 cents a ton, No. 1 heavy melting steel is now quoted between $11.25 and $11.75, thus covering several purchases by United States Steel Corp. subsidiary plants here last week. A price of $11.75 was paid for Donora, Pa., shipment, while $11.50 was paid for Bessemer, Pa., delivery. This is the first time the Corporation subsidiaries have been in the market for scrap in any amount in many weeks. At the same time an independent mill here bought No. 1 steel at $11.50; No. 2 steel for $10.25. Though $11.75 appears to be the top of the market, scrap is not definitely weak. Dealers receiving recent orders are understood to be working on a smaller margin and mill purchases have had the effect of ridding the market

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.50 to 8.50
Boston, dealers	5.00 to 5.50
Buffalo, No. 1	10.00 to 11.00
Buffalo, No. 2	8.50 to 9.00
Chicago	8.25 to 8.75
Cleve., No. 1	9.00 to 9.50
Cleve., No. 2	8.50 to 9.00
Det., No. 1	7.50 to 8.00
Det., No. 2	7.00 to 7.50
E. Pa., del. mill	9.50
E. Pa., No. 2 del.	8.00 to 8.50
Federal, Ill.	7.75 to 8.25
Granite City, Ill.	7.25 to 7.75
N. Y., deal. R. R.	5.50 to 6.00
N. Y., deal. No. 2	4.50 to 5.00
N. Y. deal. yd	**2.50 to 3.00**
Pitts., No. 1	11.25 to 11.75
St. L. No. 1 sel.	8.00 to 8.50
Valleys, No. 1	12.00 to 12.50

COMPRESSED SHEETS

Buffalo, dealers	8.50 to 9.00
Chi. (Factory)	7.00 to 7.50
Cleveland	9.00 to 9.50
Detroit	7.50 to 8.00
E. Pa. new mat.	8.00 to 8.50
Pittsburgh	11.00 to 11.50
Valleys	11.50 to 12.00

BUNDLED SHEETS

Buffalo	4.75 to 5.25
Cincinnati, del	4.75 to 5.25
Cleveland	6.50 to 7.00
Eastern Pa.	6.50 to 7.50
Pittsburgh	10.00 to 10.50
St. Louis	4.00 to 4.50

SHEET CLIPPINGS LOOSE

Chicago	3.50 to 4.00
Cincinnati	3.00 to 3.50
Detroit	3.00 to 3.50
St. Louis	4.00 to 4.50

STEEL RAILS SHORT

Birmingham	10.00 to 10.25
Boston, dealers	4.75 to 5.25
Buffalo	11.00 to 11.50
Chicago (3 ft.)	10.00 to 10.50
Chicago (2 ft.)	10.50 to 11.00
Cincinnati, del.	10.00 to 10.50
Detroit	10.50 to 11.00
Pitts. (open-hearth, 3 ft. and less)	12.00 to 12.50
St. Louis	10.50 to 11.00

STOVE PLATE

Birmingham	6.00 to 6.50
Boston, dealers	2.00 to 2.50
Buffalo	8.00 to 8.50
Chicago, net	7.00 to 7.50
Cinci., deal. net	4.25 to 4.75
Detroit, net	3.50 to 4.00
Eastern Pa.	7.00 to 7.50
N. Y., deal. Fdry.	4.50 to 5.00
St. Louis	6.00 to 6.50

COUPLERS, SPRINGS

Buffalo	10.50 to 11.00
Chicago	9.50 to 10.00
Eastern Pa.	10.00 to 10.50
Pittsburgh	13.00 to 13.50
St. Louis	9.50 to 10.00

ANGLE BARS—STEEL

Chicago	9.00 to 9.50
St. Louis	8.50 to 9.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	10.00 to 11.00
Cleveland bil. and bloom crops	12.00 to 13.00
Eastern Pa.	11.50 to 12.00
Pittsburgh billet bloom crops	13.75 to 14.25
Pitts., sheet bar crops	13.75 to 14.25

FROGS, SWITCHES

Chicago	8.25 to 8.75
St. Louis	9.00 to 9.50

SHOVELING STEEL

Chicago	8.25 to 8.75
Cleveland	5.75 to 6.00
St. Louis	7.75 to 8.25

RAILROAD WROUGHT

Birmingham	7.00 to 7.50
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	6.50 to 7.00
Buffalo, No. 2	10.00 to 11.00
Chi., No. 1, net	7.00 to 7.50
Chi., No. 2	8.25 to 8.75
Cinci., No. 2	7.50 to 8.00
Eastern Pa.	10.00 to 10.50
N. Y., No. 1, deal.	4.00 to 5.00
Pitts., No. 1	11.25 to 11.75
St. Louis, No. 1	6.00 to 6.50
St. Louis, No. 2	7.25 to 7.75

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	7.50 to 8.50
N. Y., deal.	3.25 to 3.75

BUSHELING

Buffalo, No. 1	8.00 to 9.00
Chicago, No. 1	7.00 to 7.50
Cinci., No. 1 deal.	5.00 to 5.50
Cinci., No. 2	2.75 to 3.00
Cleve., No. 2	6.00 to 6.50
Det., No. 1 new	6.25 to 6.75
St. Louis, No. 1	5.00 to 5.50
Val. new No. 1	11.00 to 11.50

MACHINE TURNINGS

Birmingham	2.50 to 3.00
Boston, dealers	2.25 to 2.50
Buffalo	5.00 to 5.25
Chicago	4.00 to 4.50
Cinci., deal.	4.00 to 4.50
Cleveland	5.50 to 6.00
Detroit	4.50 to 5.00
Eastern Pa.	5.00 to 5.50
N. Y., deal.	2.00 to 2.50
Pittsburgh	8.25 to 8.75
St. Louis	2.75 to 3.25
Valleys	8.75 to 9.25

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	1.50 to 1.75
Buffalo	5.00 to 5.50
Cinci., deal.	4.00 to 4.50
Cleveland	6.25 to 6.75
Detroit	5.75 to 6.25
Eastern Pa.	3.50 to 3.75
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.50 to 8.00

CAST IRON BORINGS

Birming., chem.	8.50 to 9.50
Birming., plain	2.50 to 3.00
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	4.50 to 4.75
Chicago	4.50 to 5.00
Cinci., deal.	4.00 to 4.50
Cleveland	6.25 to 6.75
Detroit	5.75 to 6.25
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	10.00 to 12.00
N. Y., deal.	2.50 to 3.00
Pittsburgh	7.50 to 8.00
St. Louis	3.00 to 3.50

PIPE AND FLUES

Cinci., deal.	4.00 to 4.50

RAILROAD GRATE BARS

Buffalo	5.00 to 5.50
Chicago, net	7.00 to 7.50
Cincinnati	4.50 to 5.00
Eastern Pa.	7.00 to 7.50
N. Y., deal.	4.00 to 4.50
St. Louis	5.00 to 5.50

FORGE FLASHINGS

Boston, dealers	3.25 to 3.50
Buffalo	6.50 to 7.00
Cleve. ov. 10 in.	8.25 to 8.50
Detroit	5.00 to 5.50

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	9.50 to 10.00
Eastern Pa., del.	7.00 to 7.50

ARCH BARS, TRANSOMS

Chicago, net	7.00 to 7.50
St. Louis	6.00 to 6.50

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.00 to 6.50
Chi., elec. fce.	6.50 to 7.00
Cleveland	5.50 to 6.00
Eastern Pa., del.	7.50 to 8.50
St. Louis	4.00 to 4.50

STEEL CAR AXLES

Birmingham	8.75 to 9.50
Boston, ship. pt.	8.00 to 8.50
Buffalo	10.00 to 11.00
Chicago, net	10.50 to 11.00
Eastern Pa.	14.50
St. Louis	8.75 to 9.25

SHAFTING

Boston, ship. pt.	7.50 to 8.00
Eastern Pa.	12.00 to 13.00
N. Y., deal.	7.50 to 8.00
St. Louis	7.50 to 8.00

CAR WHEELS

Birming., iron	7.00 to 7.50
Boston, iron deal.	4.25 to 4.50
Buffalo, iron	8.00 to 9.00
Buffalo, steel	10.50 to 11.00
Chicago, iron	9.50 to 10.00
Chi., rolled steel	9.50 to 10.00
Cincinnati iron	6.75 to 7.25
E. Pa. iron	9.50 to 10.00
E. Pa. steel	10.50 to 11.00
Pitts., iron	11.00 to 11.50
Pitts., steel	13.00 to 13.50
St. Louis, iron	7.00 to 7.50
St. Louis, steel	9.00 to 9.50

NO. 1 CAST SCRAP

Birmingham	8.00 to 8.50
Boston, No. 2	3.25 to 3.50
Boston, textile	6.50 to 7.00
Buffalo, cupola	9.50 to 10.00
Buffalo (mach.)	10.00 to 10.50
Chicago, agri. net	7.50 to 8.00
Chi., mach. net	8.50 to 9.00
Chi., railroad net	8.00 to 8.50
Cinci., mach. cup.	7.50 to 8.00
Cleve. cupola	8.50 to 9.50
Detroit, net	8.50 to 9.00
E. Pa. cupola	10.00 to 10.50
N. Y., cup. deal.	6.00 to 6.50
N. Y., del. local foundries	9.00 to 9.50
Pitts., cupola	10.75 to 11.25
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1	7.00 to 7.50
St. L. No. 1 mach.	7.50 to 8.00

HEAVY CAST

Boston, del.	4.25 to 4.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto net	9.00 to 9.50
Detroit, break.	6.50 to 7.00
Eastern Pa.	9.50 to 10.00
N. Y. No. 1, deal.	5.50 to 6.00
N. Y. break, deal.	5.50 to 5.75
Pittsburgh	8.75 to 9.25

MALLEABLE

Boston, consum.	9.00 to 9.50
Buffalo	10.50 to 11.50
Chicago, agri.	7.50 to 8.00
Chicago, R. R.	9.75 to 10.25
Cinci., agri. del.	8.00 to 8.50
Cinci., R. R. del.	8.50 to 9.00
Cleveland, rail	10.00 to 10.50
Detroit, auto	6.00 to 6.50
St. Louis	7.50 to 8.00

RAILS FOR ROLLING
5 feet and over

Birmingham	8.00 to 8.50
Boston, deal.	5.00 to 5.50
Buffalo	8.50 to 9.50
Chicago	10.00 to 10.50
Eastern Pa.	9.50
New York dealer	5.50 to 6.00
St. Louis	9.25 to 9.75

LOCOMOTIVE TIRES

Chicago, cut	8.50 to 9.00
St. L., No. 1	6.50 to 7.00

LOW PHOS. PUNCHINGS

Buffalo	10.00 to 11.00
Chicago	10.00 to 10.50
Eastern Pa.	10.00
Pittsburgh	13.00 to 13.50

of overhanging long tonnages, a fact which should prove strengthening this week. The Pennsylvania railroad closed June 1 on a list containing unusually large tonnages of specialties; the Baltimore & Ohio closes June 5 on a typical list of about 14,000 tons.

Cleveland—Buying is at a standstill, though expected to revive within a few days. Shipments on contract are going forward steadily. A shipload of 350 to 400 tons of busheling scrap arrived last week. Country scrap is not yet tempted by current prices. Present melt indicates higher prices soon.

Chicago—Sustained consumption of scrap lends strength and in a measure offsets the easier situation presented by absence of mill buying. Large consumers are interested in picking up only occasional small bargain lots. Heavier buying is in prospect shortly as a result of recent gains in open-hearth operations. In the meantime quotations on practically all grades are unchanged, with heavy melting steel nominally $8.25 to $8.75.

Boston—No. 2 cast and blast furnace borings and turnings are slightly firmer, but several other grades are easier, including heavy melting steel. Cast scrap is showing most ability to retain advances, including textile and No. 1 machinery. A lull in buying prevails.

New York—Prices of most grades of scrap are unchanged with buying less active. Less No. 2 is moving to the Buffalo district by barge although some is being loaded for shipment this month. Buying for export continues with some new business on No. 1 and No. 2 grades and the higher prices in the range are for barge loading.

Philadelphia—No. 1 heavy melting steel appears steady at $9.50, delivered, consumers' plant, and No. 2 steel at $8 to $8.50. Following recent heavy buying by a Coatesville, Pa., consumer, demand for melting steel has been featureless. Buying of other grades also is restricted to small tonnages, although prices are firm. Shipments against contracts are moving better.

Buffalo—Sale of a round tonnage of borings and turnings to a local melter is reported to have been made at $5.50 or more.

Dealers hold No. 1 heavy melting steel at $10 to $10.50. Larger handlers are said to have turned down flatly offers of Bethlehem to purchase at $9.50 for Lackawanna delivery.

Detroit—Iron and steel scrap continues on the surface to display indications of a slightly easier condition, yet the base continues strong and there is no warrant for reductions. The local mill continues to take in scrap in noteworthy volume. Ford is laying down his open-hearth scrap and there are some indications of early resumption of some of his open-hearth furnaces. A little more scrap is coming out from automobile manufacturers.

Henceforth, Detroit scrap prices will be f.o.b. consuming point, instead of dealers' buying prices, there now being a substantial market locally for the various grades.

Cincinnati—Prices of iron and steel scrap are unchanged, and only slightly easier because mill buying has disappeared, excepting for small lots.

St. Louis—The tone of iron and steel scrap is easier, though in only two or three grades have specific reductions been made. Due to a lull in buying, most quotations are nominal, and some scattering cars have been picked up at figures slightly below current quotations.

Birmingham, Ala.—Inquiries are still numerous though the market is not considered as strong as a few weeks ago. Prices are firm and dealers are inclined to avoid future business.

Current Bolt Prices Up; Third Quarter Not Decided

Bolt, Nut, Rivet Prices, Page 53

While no prices have been announced on bolts and nuts for third quarter, makers have reduced discounts from 75 to 73 off list for current business, effective immediately. This is an increase of about 8 per cent and includes carriage, machine, plow, blank and stud bolts as well as lag screws and nuts. Stove bolts in packages formerly quoted at 75, 25, 10 and 10 off list are now 72½, 25 and 10 off; in bulk they have been changed from 86 off to 85 off.

Rivet prices at 2.25c, Pittsburgh, and 2.35c, Chicago, are unchanged and small rivets remain at 70, 10 and 10 off.

Specifications for bolts and nuts show a gradual increase in nearly all producing centers. Railroads continue fair buyers but jobbers and miscellaneous small interests are ordering more liberally. Farm implement manufacturers buy sparingly.

Sheet Bar Shipments to Tin Plate Mills Heavier

Semifinished Prices, Page 54

Heavier shipments of sheet bars are being made to tin plate mills. Billets and slabs are moderately active, with the base price in the open market on all three products holding at $26, Pittsburgh, Youngstown, O., and Cleveland. No announcement has been made for third quarter. Wire rods are quoted $35 for shipment through July 15. Forging billets are in better demand, unchanged at $31, Pittsburgh.

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critical buyers of iron and steel quality products have placed their confidence in Central

CENTRAL IRON & STEEL CO.
HARRISBURG, PA.

Warehouse

Gain Shown in Sales; Third Quarter Prices Not Decided

Pittsburgh — Jobbers have not determined third quarter price of steel products out of stock as they have received no prices from mills. The intimation, however, is prevalent that the entire warehouse price schedule will be advanced shortly. Bookings were heavy in May. One jobber reports 40 per cent greater sales in May than in April and the month just closed was best in two years.

Cleveland — The adjustment in quantity differentials whereby prices were reduced recently for large orders and increased for small lots, has been generally accepted. No price changes are contemplated immediately, except that sellers are checking up on galvanized sheets, and an advance is an early possibility. The number of orders continues to gain, though tonnage is slow to improve, the banking situation here still exerting a retarding influence, according to warehouse interests.

Chicago — Sales declined only slightly over the end of May and the month was the best so far this year, in addition to being slightly ahead of the volume a year ago. Prices are unchanged.

Philadelphia—Warehouse buying is beginning to show an appreciable gain, particularly in number of orders. Some sellers report May as the best month this year, and some report last week as the best since last Fall. Prices are unchanged.

St. Louis—Warehouse business in May considerably exceeded the April total, and in the case of two leading interests was greater than a year ago. Miscellaneous demands still dominate, though some improvement is noted in building materials. New quantity differentials have been adopted.

Detroit — Warehouse business in May showed a substantial increase over April, with indications that June will be equally good. Demand is better diversified. Prices are unchanged.

Cincinnati—Warehouses here have advanced quotations on galvanized sheets to 4.00c from 3.55c, and No. 24 black to 3.60c from 3.50c. Jobbers report a steadily expanding demand.

Gary Sheet & Tube Co. is low on close to 100 tons of No. 24 cold-rolled, box annealed sheets for District of Columbia motor vehicle plates at 2.35, delivered at Lorain, Fairfax county, Virginia.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS □

Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New Orleans	2.50c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.50c-2.60c
Portland	3.00c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3 25c

IRON BARS □

Baltimore	2.35c
Boston††	3.10c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS □

Baltimore	2.35c-3.00c
Boston	3.10c-3 25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
New Orleans	2.75c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.50c-2.60c
San Fran. cl.	2.00c
San Fran. lcl	2.40c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES □

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES □

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3 25c
Tulsa	3.50c

NO. 10 BLUE □

Baltimore*	2.60c
Boston††	2.75c
Buffalo	3.10c
Chattanooga	3.44c
Chicago	2.75c
Cincinnati	3.05c
Cleveland	2.75c
Det., 8-10 ga.	2.90c
Houston	3.35c
Los Ang.	3.80c
New Orleans	3.25c
New York	2.75c
Portland	4.00c
Phila.*† (e)	2.50c
Pitts.**	2.60c
San Fran.	3.75c
Seattle	3.50c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK □

Balt.*†	3.25c
Boston††	3.85c
Buffalo	3.25c
Chattanooga	3.50c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.30c
Los Ang.	4.20c
New York	3.25c
Phila.*† (e)	3.15c
Pitts.**	3.35c
Portland	4.50c
San Fran.	3.70c
Seattle	4.25c
St. Louis	3.60c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS □

Balt.*†	3.75c
Buffalo	3.75c
Boston††	4.00c
Chattanooga	3.95c
Chicago	3.75c-3.85c
Cincinnati	4.00c
Cleveland	3.50c
Detroit	3.50c
Houston	3.57c
Los Ang.	4.50c
New Orleans	3.95c
New York	3.50c
Phila.*† (e)	3.60c
Pitts.**	3.60c-3.85c
Portland	5.00c
San Fran.	4.30c
Seattle	4.75c
St. Louis	3.75c
St. Paul	4.19c
Tulsa	5.10c

†BANDS □

Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New Orleans	2.75c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.20c

†HOOPS □

Baltimore	2.65c
Boston	4.90c
Buffalo	3.55c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.65c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

COLD FIN. STEEL □

Baltimore (c)	3.33c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3 15c
Los Ang.	5.50c
New Orleans	4.25c
Philadelphia	3.35c
Pittsburgh	2.95c
Portland (f)	4.50c
San Fran.(d)	5.50c
Seattle (f)	4.50c
St. Paul	3.20c
St. Louis	3.36c
Tulsa	4.65c

COLD ROLL. STRIP □

Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 15,000 lbs., extras on less.

Prices at Detroit, Cleveland, New York, Chicago, Pittsburgh, Cincinnati and St. Louis on heavier lines are subject to new quantity differentials: 399 pounds and less, up 50c; 400 to 999 pounds, base; 1000 to 4999 pounds, 20c off; 5000 to 9999 pounds, 40c off; 10,000 to 39,999 pounds, 60c off; 40,000 pounds and over, 75c off.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 7.75c, Conn., for copper

Sheets

Yellow brass (high)	13.12½
Copper, hot rolled	15.37½
Lead sheets, cut to jobbers	7.75
Zinc sheets (100-lb. base)	9.00

Tubes and Pipes

Seamless yellow brass (high)	14.75
Seamless copper	14.87½

Rods

Yellow brass (high, full turning)	10.62½
Naval brass	11.75

Anodes

Copper, untrimmed	12.75

Wire

Yellow brass (high)	13.12½

Old Metals

Dealers' buying prices, cents lb

No. 1 Composition Red Brass

New York	4.00 to 4.25
Chicago	3.50 to 4.00
Cleveland	5.00 to 5.50
St. Louis	3.25 to 3.50

Heavy Yellow Brass

New York	3.00 to 3.25

Heavy Copper and Wire

New York	5.75 to 5.87½
Chicago, No. 1	4.75 to 5.25
Cleveland	5.00 to 5.50
St. Louis	3.75 to 4.00

Composition Brass Borings

New York	3.50 to 3.75

Yellow Brass Tubing

Cleveland	3.25 to 3.75

Light Copper

New York	4.50 to 4.62½
Chicago	3.50 to 4.00
Cleveland	4.25 to 4.75
St. Louis	3.25 to 3.50

Light Brass

Chicago	2.25 to 2.50
Cleveland	2.25 to 2.75
St. Louis	2.25 to 2.50

Lead

New York	2.87½ to 3.12½
Cleveland	3.00 to 3.25
Chicago	2.25 to 2.50
St. Louis	2.50 to 2.75

Zinc

New York	2.00 to 2.12½
Cleveland	1.75 to 2.00
Chicago	1.75 to 1.87½
St. Louis	1.50 to 1.75

Aluminum

Clippings, new, soft, Cleve.	12.50 to 14.00
Clippings, hard, Cleveland	8.00 to 8.50
Borings, Cleveland	4.50 to 5.00
Mixed cast, Cleveland	6.50 to 7.00
Mixed cast, St. Louis	6.25 to 6.75

Secondary Metals

Brass ingot, 85-5-5-5	8.00
Remelt aluminum No. 12	10.50 to 11.50

Metals

Prices Push to Still Higher Levels as Inflationary Move Gains More Momentum

New York—Continued improvement in the general business situation and the growing conviction that this will be well sustained even over the summer months, coupled with the move for further inflation, resulted in a rapid upward push in the metals during the past week to new high levels for the movement.

Copper—Electrolytic metal shot up ¾-cent last week to the basis of 8.00c, delivered Connecticut. This was the highest level since July, 1931, and 60 per cent above levels obtaining only a few weeks ago. Lake and casting grades went up proportionately with the former at 8.12½c and the latter at 7.75c. The advances in ingot metal were followed closely by higher prices on brass ingot, copper and brass rolled products, copper wire and scrap. Fairly active buying accompanied the advance in copper, mostly for delivery into September. Copper statistics issued for the first time for 1932 showed that refined stocks went up about 28,000 tons during the year compared with a gain of more than 175,000 tons in 1931, 195,000 tons in 1930 and 105,000 tons in 1929.

Lead—Heavy demand developed and prices jumped $7 a ton to 4.10c a pound, New York, and 3.95c, East St. Louis. All classes of consumers were well represented in the market with corrodors probably the heaviest buyers. Most of the recent buying has been for July delivery.

Zinc—Galvanizers were the heaviest buyers of zinc with the total tonnage booked by all consumers well over the recent average. Prices moved up sharply and were given support by a strong ore market in the Tri-State district.

Aluminum—Remelt grades continued to gain strength due to a tighter situation in scrap supplies.

Tin—The metal continued to reflect to the greatest extent the inflationary move, due to its close tie-up with sterling exchange. Heavier shipments in this country and sharp advances on the London metal exchange also were contributing factors. Straits metal was quoted well above the 40-cent level or the highest since late 1929.

Antimony—The metal did not show the sharp general rise but closed somewhat higher. Little activity was noted.

Coke By-Products Firm

New York—Contract shipments of naphthalene have passed the seasonal peak, but activity is practically balanced by somewhat heavier spot demand. The bulk of regular shipments of sulphate of ammonia on contracts also have been made to fertilizer companies, although demand for top-dressing is active. Distillates are fairly active, notably toluol for lacquer makers. Prices are unchanged and firm.

Coke By-Products

Per Gallon Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.15

Quicksilver Steady

New York—Quicksilver prices are steady with small lots $57, a virgin flask of 76 pounds, and rounds lots around $56 to $56.50 a flask.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
May 27	7.25	7.37½	7.00	38.25	38.37½	3.75	3.60	4.00	*22.90	6.25	35.00
May 29	7.50	7.62½	7.25	39.12½	39.25	3.90	3.75	4.20	*22.90	6.25	35.00
May 30—Holiday											
May 31	7.75	7.87½	7.50	40.75	40.87½	4.10	3.95	4.30	*22.90	6.25	35.00
June 1	8.00	8.12½	7.75	40.75	40.87½	4.10	3.95	4.35	*22.90	6.50	35.00
June 2	8.00	8.12½	7.75	41.12½	41.37½	4.10	3.95	4.30	*22.90	6.50	35.00

*Nominal quotation. Market range 19.90c to 22.90c.

Pacific Coast

Current Lettings Light but Much Is in Prospect—Towers For Transmission Line from Boulder Dam Offer Large Tonnage—Utah Pig Iron Is Being Bought for Northwest

San Francisco—(*By Air Mail*)—Few awards were noted during the past week, but prices are holding firmly to established levels. Structural fabricators are evidencing considerable interest in the 28,000-ton transmission tower project for the Bureau of Water and Power, Los Angeles, which is expected to come out for figures within the next two weeks. Activity on the Pacific coast has not yet reflected the decided improvement noted in the eastern markets.

While over 6800 tons of reinforcing bars are up for figures or pending, only one award of over 100 tons was reported. Pacific Coast Steel Corp. booked 432 tons for the Bureau of Water and Power. Bids have been opened on 270 tons for the Eagle Mountain, Hayfield and Mecca Pass tunnels for the metropolitan water district, Los Angeles, and on 100 tons for a state hospital at Camarillo, Calif. Out-of-stock prices in the San Francisco and Los Angeles districts continue around 2.00c, base on carload lots.

Awards of structural shapes aggregated over 1000 tons. Moore Drydock Co. secured 700 tons for caissons in connection with the Golden Gate bridge, San Francisco. McClintic-Marshall Corp. took 255 tons for the Kress store in Phoenix, Ariz., and unnamed interest booked 100 tons for a crossing over the Santa Fe tracks near San Bernardino, Calif. Bids have been opened on 414 tons for a bridge over the Stanislaus river in California. Metropolitan water district expects to call for bids sometime this year on 20,000 tons for transmission towers. Plain shapes are firm at 2.10c, c.i.f.

Seattle Sees Upturn

Seattle—Continued improvement is noted in iron and steel in the Pacific Northwest. Prices are firm and advances are expected daily. Mill prices are strong at 1.80c for plates, 2.10c for bars and shapes, 2.20c for wide flange and 3.00c for reinforcing steel in small lots.

Foundry operations are increasing as evidenced by the sale of several cars of pig iron this month, a larger turnover of this material than for any similar period in two years. No. 1 Columbia iron is quoted at $19.50 to $20. f.o.b. plant, based on $14.50, f.o.b. furnace, and $5.14 freight and tax. Due to the general firmness prices are expected to rise. Some English hematite pig iron has been sold in this market for special purposes but foreign iron finds it difficult to compete with Columbia from Provo, Utah, which is delivered here in a week or ten days after ordering.

Awards continue in small tonnages but several important projects will be up for figures soon. This week Isaacson Iron Works, Seattle, booked two jobs involving 400 tons of shapes. One contract is for six large derrick three-drum units, each weighing 50 tons and each operated by a 150-horsepower electric motor These are for use in connection with clam shell buckets on the excavation for piers of the Interbay bridge, San Francisco. The same firm also has 100 tons for the Tumwater brewery plant, Olympia, Wash., for which Pacific Coast Steel Corp. will furnish 50 tons of reinforcing. Romano Engineering Co., Seattle, opened bids May 31 for erection of 256 tons of steel for the Skykomish bridge, Wash., fabricated by Pacific Car & Foundry Co., Seattle.

Steel in Europe

British Gains Continue; Continent Awaits New Prices

London — (*By Cable*) — Middlesbrough and the Scottish districts offer no important changes in steel and iron conditions, but in the Birmingham district the trend is distinctly better. A blast furnace stack is to be restarted shortly. In South Wales the tin plate trade has improved greatly and some works are booked until the end of the year. Prices are firm.

The Continent reports markets are inactive, awaiting fixing of prices by the new international comptoirs. The German domestic market is better.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 1

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON		£ s d		£ s d
Foundry, 2.50-3.00 Silicon	$11.67	2 18 6	$ 8.27	1 14 0
Basic bessemer	10.77	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	11.77	2 19 0	.....	.....
SEMIFINISHED STEEL				
Billets	$19.95	5 0 0	$10.95 to $11.19	2 5 0 to 2 6 0
Wire rods, No. 5 gage	29.93	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$30.92	7 15 0	$26.77	5 10 0
Merchant bars	1.16c	6 10 0	.63c	2 17 6
Structural shapes	1.31c	7 7 6	.56c to .57c	2 11 6 to 2 12 0
Plates, †¼ in. or 5 mm.	1.47c	8 5 0	.85c	3 17 6
Sheets, black, 24 gage or 0.5 mm.	1.51c	8 10 0	1.29c	5 17 6
Sheets, gal., 24 gage, corr.	1.87c	10 10 0	1.49c	6 15 0
Bands and strips	1.38c	7 15 0	.74c	3 12 6
Plain wire, base	1.56c	8 15 0	1.18c	5 7 6
Galvanized wire, base	1.87c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.14c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 3.34	0 16 9	.....	.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d	French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$12.47	3 2 6*	$ 9.34	200	$ 9.74	295	$19.08	69
Basic bessemer pig iron	11.77	2 19 0*	9.34	200	7.43	225	20.88	75.50
Furnace coke	2.64	0 13 3	5.60	120	3.63	110	5.32	19.25
Billets	19.95	5 0 0	17.98	385	13.53	410	26.68	96.50
Standard rails	1.47c	8 5 0	1.46c	697	1.73c	1,150	1.68c	132
Merchant bars	1.20c	6 15 0	1.11c	530	.79c	525	1.40c	110
Structural shapes	1.56c	8 15 0	1.16c	550	.77c	510	1.37c	107.50
Plates, †¼-in. or 5 mm.	1.54c	8 12 6	1.43c	680	1.01c	675	1.61c	127
Sheets, black	1.69c	9 10 0§	1.79c	850‡	1.09c	725‡	1.83c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.09c	11 15 0	2.94c	1,400	2.18c	1,450	4.70c	370
Plain wire	1.56c	8 15 0	2.37c	1,130	1.95c	1,300	2.25c	177
Bands and strips	1.69c	9 10 0	1.22c	580	1.01c	675	1.61c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) dd. Middlebrough.

Equipment

Demand Slow to Reach Higher Levels of Other Lines

Chicago—Demand continues spotty and in general shows little change. Railroads have yet to increase their purchases of machine tools and other equipment to any marked degree, but sellers are confident that future months will witness a growing volume of business from that industry. Miscellaneous manufacturing companies are making only imperative purchases. Steel company activity in equipment buying so far has been limited principally to heavy machinery, featured by mill purchases by the American Sheet & Tin Plate Co. and Inland Steel Co. The latter may buy equipment for a maintenance shop in connection with its new tin mill.

Pittsburgh—Steel mill equipment builders here booked considerably more business in May than in April and while much of this work was for repair, maintenance, and rehabilitation programs, some large mill installations definitely will be awarded before long. In connection with new open hearths which Great Lakes Steel Corp., Detroit, is about to build, additional soaking pits and other equipment are reported to be required. Changes involving an expenditure of approximately $12,000,000 at the Edgar Thomson steelworks of the Carnegie Steel Co., Pittsburgh, are being kept up to date from the standpoint of engineering costs inasmuch as a recent cost revision was made. Makers of special machinery report a widening volume of inquiry with some occasional pieces of equipment being closed upon.

Worcester, Mass.—Improvement in several leading New England manufacturing industries thus far has failed to affect machine builders and equipment plants materially. Shops supplying textile mill equipment are booking more orders for both new units and repairs, demand for repair parts also coming from other sources in heavier volume. A Worcester loom works is expanding operations. Two New England builders shared in a 12-tool list for the Frankford, Pa., arsenal. Brown & Sharpe Mfg. Co., Providence, R. I., booking six automatic screw machines and a number of special tools while the New Britain-Gridley Co. took a chucking machine.

New York—Improvement in demand for machinery and equipment has been slight, although in spots some material gains have been made and inquiry is heavier. Most manufacturing industries are operating at higher rates and recent increased activity among ball bearing plants continues. Repair parts are more active. Frankford, Pa., arsenal recently placed $50,000 worth of equipment, W. E. Shipley Machinery Co., Philadelphia, taking two draw presses and a jacket trimming machine; and Hall Planetary Co., Philadelphia, booking a planetary milling machine. Lloyd & Arms Inc. is low on a cylinder grinder for the navy and the Lidgerwood Mfg. Co., Elizabeth, N. J., is low on steering gears and electrohydraulic equipment.

Cleveland—Sales continue spotty, with occasional flurries of good business, the general trend holding to its upward course, although at a slower rate than some other lines.

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Mills, Warehouses Share Small Lots Problem

(Concluded from Page 25)

2,327,000 was distributed through steel warehouses—this gives us the 17 per cent. In 1932 the tonnages were 3,928,000, 898,000, respectively, the percentage being 23.

In the old days, while the mills were racing with demand their backlogs were anywhere from a few weeks to several months; thus for a good many years a substantial part of the business of the steel warehouses came from customers who could not wait for mill deliveries. In point of time in making deliveries the advantages enjoyed by the warehouses have been narrowed from months to days, even to hours.

These changes in the production processes of the steel companies, their improved facilities for handling small orders, and the shortening of time in making mill shipments, all combined with the vastly improved trucking services as well as better railroad service cannot be discounted nor minimized by secondary distributors of steel. No longer is your market a "natural," protected by the mill backlog: it is a market that exists only in proportion to the services rendered by the warehouses and the reasonableness of prices.

Fairplay Is Answer

An important step in any effort you may make to clarify the skies that are clouded by the small orders is to throw your own houses open to the bright sunlight of fairplay and good business. Your function, as well as the protection of your sizable investments in the warehouse business, is to serve efficiently as warehouse distributors of steel. Every order you take as a broker undermines the capital you have invested in your warehouse business.

You vitiate your own best interests every time you ask a mill to make a direct shipment on warehouse account. If you expect the mills to reject the small orders, how can you expect to earn their good will and enlist their assistance when you encroach upon their markets?

Neither the warehouses nor the steel mills can solve this problem alone. This is a problem of the steel industry as a whole. You occupy a key position in this basic industry; your position will be enhanced in proportion to what you give. Your relationship with the mills cannot be one of all take and no give. To the degree the warehouses and the mills co-operatively uncover the facts surrounding the merchandising of small quantities of steel and use this knowledge impartially, you will progress toward a workable, sound, fair and economic solution of your mutual dilemma.

Here and There in Industry

E. W. BLISS CO., Brooklyn N. Y., has completed plans to consolidate its manufacturing, engineering and principal sales offices with those of its subsidiary, Toledo Machine & Tool Co., Toledo, O., which will give economies and better efficiency. The entire Bliss line formerly produced at Brooklyn will be manufactured at Toledo. A sales office and complete repair shop will be maintained at the present Brooklyn address, Fifty-third street and First avenue.

□ □ □

Whiting Corp., Harvey, Ill., has moved its office in Chicago to the Marquette building, 140 South Dearborn street.

□ □ □

Muncie Gear Co., Muncie, Ind., has been placed in the hands of Albert E. Needham as receiver, on petition of the Indiana Foundry Corp.

□ □ □

Jewett & Co., Buffalo, manufacturer of stoves and ranges, has been placed in charge of Chester M. Smith as receiver, who will continue operation of the plant.

□ □ □

Vanadium Alloys Corp. has transferred to the Molybdenum Corp. of America, Pittsburgh, 42 claims and other properties in the Southwestern part of Mesa county, Colorado. The land is said to contain vanadium ore.

□ □ □

Link-Belt Co., Chicago, has moved the purchasing department of the Caldwell-Moore plant to its Pershing road plant, 300 West Pershing road, Chicago, thus combining purchasing, under supervision of Henry M. Coen.

□ □ □

Northern Equipment Co., Erie, Pa., manufacturer of Copes feed water regulators, differential valves, pump governors and allied equipment, has appointed C. H. Wilson, 1403 Park boulevard, Troy, N. Y., sales representative in the Albany district.

□ □ □

Simplex Engineering Co., Washington, Pa., has obtained the exclusive sales rights for patents secured by L. S. Longenecker on an interlocking arch refractory. Mr. Longenecker was with the Jones & Laughlin Steel Corp., Pittsburgh, for several years and recently had been with the Interlocking Arch Co.

□ □ □

Continental Tool division of Ex-Cell-O Aircraft & Tool Corp., Detroit, has been moved from 5835 Martin avenue to the main plant of the Ex-Cell-O company, 1220 Oakman boulevard. Centralization of manufacturing activities is effected to improve service on the lines of cutting tools manufactured by the Continental division.

□ □ □

Bryant Heater & Mfg. Co., 17825 St. Clair avenue, Cleveland, has approved plans for consolidation with the S. R. Dresser Mfg. Co., manufacturer of line pipe couplings, Bradford, Pa. James E. Kinner is president of the Bryant company. The plant of the latter at Cleveland will be continued in operation and may be enlarged.

□ □ □

R. L. Batteiger & Co., Widener building, Philadelphia, has bought the old plant of the American Horseshoe Co., Phillipsburg, N. J., for dismantling and resale. Among salvage items are a 15-ton locomotive crane with 40-foot boom, a 25-ton alligator billet shear, miscellaneous pumps, condensers, compressors and blowers. The plant has been idle about three years.

□ □ □

Inland Steel Co., Chicago has published a book planned with particular reference to the Century of Progress exposition. Development of the company in step with the growth of the Central West is disclosed and a section gives an illustrated explanation of the production of steel, in non-technical language. Another section shows the tremendous diversity of the application of steel in the modern world.

□ □ □

Meriam Co., Cleveland, J. B. Meriam president, has felt a steady increase in business for several weeks, with wide distribution of orders indicating a general gain in conditions. Recent orders include a direct-coupled gas engine generator set for the Forrest hotel, Hattiesburg, Miss.; 60-horsepower gas engine for driving an ice machine for the Wood Ice Co., Bowling Green, O.; 100-kilowatt gas engine generator unit for Fort Worth Macaroni Co., Ft. Worth, Tex., and several engines and generator sets for various destinations in Ohio.

□ □ □

Homestead Valve Mfg. Co., Coraopolis, Pa., has appointed several new sales representatives for its vapor spray machines for cleaning. Mine & Smelter Equipment Co., Seventh avenue and Santa Fe tracks, Phoenix, Ariz., will cover Arizona; R. S. Armstrong & Bro. Co., 676 Marietta street, Atlanta, Ga., for Georgia; Nixon-Hasselle Co., Carter and Thirteenth streets, Chattanooga, Tenn., for middle and eastern Tennessee.

□ □ □

Baldwin Locomotive Works, Philadelphia, through its subsidiary, the Baldwin-Southwark Corp., has started production of air handling equipment, with sales to be handled by the De La Vergne Engine Co. More than 70 per cent of the Baldwin company's business is now represented by its diversified interests outside of the locomotive field, it is said. Baldwin-Southwark Corp. consolidates all of Baldwin's activities in the field of heavy machinery not connected with locomotives. It controls, besides the De La Vergne Engine Co., the Southwark Foundry & Machine Co., I. P. Morris & De La Vergne Inc., and the Pelton Water Wheel Co.

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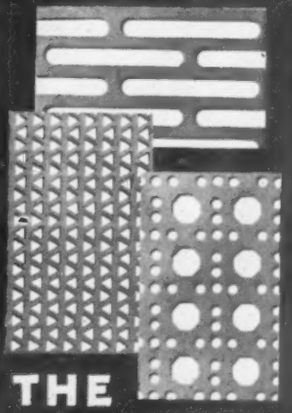

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Iron and Steel At Chicago Fair

(*Concluded from Page* 16)

sential contribution of power and of lubrication. Otis Elevator Co. operates escalators to a balcony giving a close-up view of the screen.

Featured among the Pullman Co.'s exhibit of passenger car facilities are two all-aluminum sleeping and observation cars. These cars are of recent design and weigh 96,980 pounds in contrast to the 160,000 to 180,000 pound weight of the ordinary sleeper.

Finest Trains Are Shown

Most leading railroads are represented by models, dioramas and full-size cars and locomotives. The world's finest trains from Mexico, England and the United States are available for comparison. Railroad equipment companies, including American Steel Foundries, Poor & Co., General Steel Casting Corp., Union Switch & Signal Co. and the Westinghouse Air Brake Co. are displaying their products.

Developments in the automotive and aviation industries are shown in latest models of both types of transportation. The Alemite Corp., Clark Tructractor Co., Harnischfeger Corp., Timken-Detroit Axle Co., Timken Roller Bearing Co., Ahlberg Bearing Co., Johnson Motor Co., Waukesha Motor Co., Wayne Pump Co. are other companies exhibiting in the Travel and Transport building.

Outdoors the International Harvester Co. operates a modern farm tractor by radio in addition to other agricultural machinery. Barber-Greene Co. operates trench digging and ditching machinery. An auto parking tower, 80 feet high, built by the Whiting Corp., carries 16 automobiles as a display for this company and the Nash Motors Co.

Can See Own Car Assembled

General Motors Corp. advertises its products in a $1,250,000 building housing the latest models in addition to a complete assembly plant for the production of Chevrolet cars. This building, ⅛-mile long and 306 feet deep, accommodates 1000 people at a time to witness operations on the assembly line. A visitor may select the materials for his own car and drive it off himself. Subsidiaries of General Motors Corp., including the Hyatt Roller Bearing Co., also have exhibits in this building.

The Chrysler Corp. building, located nearby, also is a large structure and overlooks a quarter-mile outdoor testing track where spectators may test Chrysler cars. Within the building are exhibits of motors, body construction, chassis and tires. Also of interest in the transportation field is the Firestone Tire & Rubber Co. building where a complete production unit manufactures automobile tires.

Shows Steel House Designs

The Home and Industrial Arts group, consisting of a number of model homes, includes several all-steel structures and some of partial steel construction. This exhibit, representing the most modern developments in design and building of domestic dwellings, was described in detail in the April 3 issue of STEEL.

Johns-Manville Co. displays its various products for the control of heat, sound and motion in its own building, while the American Radiator & Standard Sanitary Corp. has its separate exhibit.

Aside from the commercial displays are the many exhibits of states and divisions of the federal government, in addition to a number of foreign countries. The Sky Ride, the most spectacular feature of the fair, while essentially an amusement and entertainment device, at the same time is a joint exhibit of the various companies who co-operated in building the huge towers and cableway. The construction of this ride was discussed in the Jan. 23 issue of STEEL.

Construction and Enterprise

New England

MERIDEN, CONN.—Foster, Merriam & Co. iron foundry was severely damaged by fire May 14. Loss set at $30,000.

New York

BATAVIA, N. Y.—Defeat of a $500,000 bond issue for a gravity water system for this city has caused the project to be revised as a possible Reconstruction Finance Corp. loan.

BUFFALO—Arthur J. Slade, 40 Louise parkway, Tonawanda, N. Y., has asked the city for a franchise to construct a $2,000,000 central heating plant for the business district of Buffalo.

NEW YORK—Motorwise Corp. of America has been incorporated with 100 shares no par value to manufacture machinery and motors, by Kurt Reinhold, 106 West End avenue, New York.

New Jersey

HARRISON, N. J.—New Jersey Foundry Co., George Franz, president, has leased the 1-story foundry building at 300 Bergen avenue, Harrison, for the manufacture of brass, bronze and aluminum castings and plumbing supplies.

PASSAIC, N. J.—Passaic Piece Dye Works, E. G. Allberger treasurer, 420 Bloomfield avenue, has let a general contract for a 1-story brick and steel addition to its boilerhouse to E. S. Hammond Inc., 45 Clinton street, Newark, N. J., to cost about $28,000, with equipment.

Pennsylvania

PHILADELPHIA—S. K. F. Co., 40 East Thirty-fourth street, New York, has let a contract for an addition to its manufacturing building at Front and Erie streets to Turner Construction Co., Architects building, Philadelphia. Cost is estimated to be $150,000.

Michigan

JACKSON, MICH.—Viking Mfg. Co. has been incorporated with $50,000 capital and 500 shares no par value, to manufacture machinery, by John A. Erickson, 324 Otsego avenue.

MUNISING, MICH. — City plans construction of a municipal power plant at estimated cost of $200,000. Alvord, Burdick & Howson, engineers, Chicago, are making preliminary survey.

Indiana

AKRON, IND.—Shank Hardware Foundry Corp. has been incorporated with 100 shares no par value to manufacture castings, by Gomer L. Shank, John Lockerbie, M. Ebbo and Raphael F. Quanrandille.

FORT WAYNE, IND.—Scientific Instruments Inc., has been incorporated with 1000 shares no par value to manufacture scientific and surgical instruments, by Emmett J. Calligan, John F. Wemhoff and Herbert A. Kern.

Illinois

CHICAGO—Spear Novelty Co. Inc., 325 West Jackson boulevard, has been incorporated with $5000 capital to manufacture buttons and novelties, by Gilbert Ribbach, 222 West Adams street.

PANA, ILL.—Tanner Hide & Metal Co., 309 East Washington street, has been incorporated with $5000 capital to operate a general waste business, by Logan G. Griffith, attorney, Pana, Ill.

Southern States

WASHINGTON—Bids will be received until June 20 by the veterans'

administration, room 764 Arlington building, for boilerhouse and equipment for the veterans' administration facility at Marion, Ind.

BALTIMORE—Department of public works, Municipal office building, is having plans prepared for a pumping plant for the municipal water system at Ashburton, Md., to include an 18-million gallon and a 12-million gallon per day pump. Cost is estimated at $350,000. Work will be started in the fall.

MEMPHIS, TENN. — Tennessee Brewing Co., care C. M. Bishop, Floyd Piano Co., 162 Madison avenue, recent organized, will build a brewery to cost $150,000, including boiler house and electric power equipment.

JEWELL RIDGE, VA.—Jewell Ridge Coal Co. will build a steam power plant. Contracts for building and foundations has been let to B. F. Parrott & Co., Roanoke, Va., at $125,000.

Arkansas

BLYTHEVILLE, ARK.—A committee headed by O. W. Coppedge has been named by the city council to obtain data on a municipal waterworks and electric light and power station.

Texas

HOUSTON, TEX.—Southern Pacific Railway Co., Houston, Tex., plans an electric power plant for central heating and other operating service in its new passenger and freight terminal, which is expected to cost about $1,200,000.

Wisconsin

HUDSON, WIS.—City, G. R. Hosford clerk, plans construction of a municipal electric light and power plant to cost about $200,000. P. R. Bannister, North St. Paul, Minn., is engineer.

MILWAUKEE—State of Missouri highway department has ordered 10 large road-working tractors from Allis-Chalmers Mfg. Co.

MILWAUKEE—A. N. Miller Co., 2817 North Thirty-second street, manufacturer of special machinery, tools and dies, has leased shop space at 2140 North Thirty-seventh street.

MILWAUKEE—United States army has placed an order with Allis-Chalmers Mfg. Co. for 50 large industrial tractors for motorization of artillery, the order being for about $150,000.

MILWAUKEE—United States lighthouse superintendent here has awarded a contract for three oil engines to the Kahlenberg Bros. Co., Two Rivers, Wis., at $3375.

MILWAUKEE—Harnischfeger Corp. has received an order for two mucking machines costing $25,000 for use on the tunnel project of the Metropolitan water district of southern California.

MILWAUKEE—Stolper Steel Products Corp., 3258 West Fond du Lac avenue, specializing in automotive stampings, has perfected a sheet steel beer case which is being put on large scale production.

MILWAUKEE—Joy Rider Co. has been organized by Andrew Asikainen to manufacture a new type of merry-go-round and other steel playground equipment. Production is under contract by the Lakeside Bridge & Steel Co. and Wisconsin Bridge & Iron Co.

MILWAUKEE—Bayley Blower Co. has moved its works from 1938 South Fourth street to 1817 South Sixty-fourth street, West Allis, a suburb, where larger and more modern quarters are available. The company manufactures air-conditioning equipment. Ernest Szekely is vice president and general manager.

SHEBOYGAN, WIS.—Steel Container Corp. has been incorporated with 1000 shares no par value to manufacture boxes, cases and other metal specialties, by W. E. Jung, Edward A. Juul and J. H. Carter.

TWO RIVERS, WIS.—City commission has engaged Jerry Donahoe Engineering Co., Sheboygan, Wis., to make preliminary surveys and estimates for a new municipal filtration plant to cost about $100,000. E. J. Donnelly is city manager.

Iowa

ROCKFORD, IOWA—City council has appropriated $105,000 for a municipal electric light and power plant and distributing system. Bids will be asked soon for prime movers, transformers, switchboards and other equipment. H. L. Cory Co., Redick Tower building, Omaha, Nebr., is consulting engineer.

Kansas

BURLINGTON, KANS.—City council will order a special election soon on a proposition to issue $118,000 in bonds for a municipal electric light and power plant and distributing system. E. T. Archer Co., New England building, Kansas City, Mo., is consulting engineer.

Arizona

TUCSON, ARIZ.—Arizona Ice & Cold Storage Co. plans a 1-story ice manufacturing and cold-storage plant of 20 tons per day capacity, to cost about $60,000, with equipment.

Pacific Coast

LOS ANGELES—Bowlus Engineering Co. has leased factory space here for the manufacture of oilwell pumps, a force of 15 people being employed at the start.

LOS ANGELES—Bureau of power and light, 207 South Broadway, will ask bids soon in connection with its 271-mile transmisson line from Boulder dam, including 2256 steel towers, oil circuit breakers, transformers and other equipment.

PORTLAND, OREG.—G. E. Votaw, 914 Commerce building, superintendent of the Spokane, Portland & Seattle railroad, will receive bids June 15 for repair supplies for rolling stock for the fiscal year beginning July 1. Bids will cover bolts, nuts, bar iron, castings, forgings, boiler plates and tubes.

THE DALLES, OREG.—The Dalles Bridge Co. has received a federal permit to build a toll bridge at Celilo locks, near here. E. M. Chandler, Olympia, Wash., engineer, is preparing plans.

WENATCHEE, WASH. — R. H. Thompson, engineer, Seattle, who has surveyed the Mt. Stuart domestic water system, reports the cost will be $870,0000, including dam, pipeline and reservoir.

WILLAPA, WASH.—Willapa Valley Water Co. has been incorporated without capital by J. I. O'Phelan, attorney, for Andrew Kraus and associates. A survey is proposed in preparation for a community water system to cost $75,000.

ANCHORAGE, ALASKA—Roundhouse of the Alaska railroad at Curry, Alaska, was destroyed by fire May 15, one locomotive ruined and other equipment damaged, with loss of about $75,000.

Dominion of Canada

KITCHENER, ONT. — Dominion Electrohome Industries Ltd. has been incorporated with $308,000 capital to manufacture household appliances, by Frederick G. Gardiner, Harry S. Parkinson and Donald H. Rowan, all of Toronto.

OTTAWA, ONT.—George S. Grant Construction Co. Ltd. has been incorporated with $40,000 capital to act as manufacturer and contractor, by Robert R. Evans, Hamilton, Ont.

PETERBOROUGH, ONT.—Grant & Loucks Co. Ltd. has been incorporated with $40,000 capital to manufacture electrical supplies and appliances, by Roderick Grant, John Dishart and Donald A. Loucks, all of Peterborough, Ont.

TORONTO, ONT.—Sanitary Mfg. Co. will resume operations in June as a result of improved conditions and demand for its products. The plant has been idle several months. More than 400 men will be employed.

TORONTO, ONT.—Master Refrigeration Ltd. has been incorporated with 5000 shares no par value to manufacture refrigeration equipment, by Kenneth F. Mackenzie, George S. Saunderson and John H. Wood, all of Toronto, Ont.

TORONTO, ONT.—Deer Fixture Co. has been incorporated with $40,000 capital to manufacture scales, slicers, coffee mills and store fixtures, by John M. Mackintosh, Charles H. Walker and Edward W. Kenrick, all of Toronto, Ont.

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